

**Summary of the November/December 2000
and January 2001 EISCAT campaigns.**



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13. SUPPLEMENTARY NOTES					
14. ABSTRACT This report results from a contract tasking University of Oslo as follows: The contractor will investigate disturbances in the polar ionosphere caused by fluctuating solar winds. In particular, he will attempt to accurately locate the boundary between open and closed magnetic field lines and then determine which processes occur on each of the field lines. These measurements will be made during quiet and disturbed conditions.					
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16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UL	18. NUMBER OF PAGES 160	19a. NAME OF RESPONSIBLE PERSON David M. Burns, Lt Col, USAF
a. REPORT UNCLAS	b. ABSTRACT UNCLAS	c. THIS PAGE UNCLAS			19b. TELEPHONE NUMBER (Include area code) +44 (0)20 7514 4955

Contents:

1. Overview of the campaigns
2. Summary plots from the Nov/Dec 2000 campaign, day by day
3. Summary plots from the January 2001 campaign, day by day

July 19, 2001
Plasma and Space Physics Group
Department of Physics
University of Oslo

Campaign: November/December 2000

Joint campaign during POLAR overpasses.

The VHF in Tromsø was also running.

All data is tau0 12.8 seconds, and both antennas were used.

Date	Time started	Time stopped	Notes
November 24, 2000	17:01:26 UT	22:02:21 UT	Antenna 1 is pointing north (Az-14.5, El 30), along Tromsø VHF. No optics
November 25, 2000	16:59:53 UT	22:02:00 UT	Antenna 1 is pointing north (Az-14.5, El 30), along Tromsø VHF. No optics
November 27, 2000	17:06:47 UT	22:00:09 UT	Antenna 1 is pointing north (Az-14.5, El 30), along Tromsø VHF. Some optical coverage from the beginning but increasing cloud cover (CLUSTER/POLAR). Airport interlock from 17:23 to 17:43. From 19:00 Antenna 1 is pointing along the Ny Ålesund meridian (Az-45, El 30), due to good optical conditions
November 28, 2000	18:25:23 UT	23:31:46 UT	Antenna 1 is pointing along the Ny Ålesund meridian (Az-45, El 30). Some optics from LYR through cloud cover. Got nice aurora in the beam looking north, and were allowed to run longer
December 1, 2000	16:59:19 UT	22:00:21 UT	Antenna 1 is pointing along the Ny Ålesund meridian (Az-45, El 30). No optics. Field aligned dish: Nice ionization below 200 km between 17:00 and 17:10, due to a strong green arc
December 4, 2000	17:05:40 UT	23:01:29 UT	Antenna 1 is pointing north (Az-15, El 30), along Tromsø VHF. No optics. Jøran got extra time to see if the expansion phase of the substorm was coming
December 7, 2000	17:00:11 UT	22:00:03 UT	Antenna 1 is pointing south (Az135, El 30), towards Tromsø VHF. No optics. Airport interlock from 17:00 to 17:10. <u>Missing data</u> : Sudden stop in the recording from 17:15 to 17:27

CAMPAIGN: January 2001

At the radar site:

- Kjellmar Oksavik
- Jøran Moen
- Herb Carlson

All data is tau0 3.2 seconds

Herb Carlson's scanning modes:

	<u>Scan Width</u>	<u>Direction</u>
1. Windshield wiper scan between 15 and 105 az at 30 el Slew speed = 0.703 deg/sec Dwell = 128 sec (<i>cycle = 4 * 64 sec</i>)	90°	East
2. Windshield wiper scan between 30 and 150 el at -45 az Slew speed = 0.938 deg/sec Dwell = 128 sec (<i>cycle = 4 * 64 sec</i>)	120°	Meridian
3. Windshield wiper scan between -165 and -75 az at 30 el Slew speed = 0.703 deg/sec Dwell = 128 sec (<i>cycle = 4 * 64 sec</i>)	90°	West
4. Windshield wiper scan between -75 and 15 az at 30 el Slew speed = 0.703 deg/sec Dwell = 128 sec (<i>cycle = 4 * 64 sec</i>) > Set up 18 * 6.4 s on 32m antenna and 2 * 6.4s on 42m antenna	90°	North
5. Windshield wiper scan between 105 and 195 az at 30 el Slew speed = 0.703 deg/sec Dwell = 128 sec (<i>cycle = 4 * 64 sec</i>) > Set up 18 * 6.4 s on 32m antenna and 2 * 6.4s on 42m antenna	90°	South
6. Windshield wiper scan between 30 and 90 az at 30 el Slew speed = 0.313 deg/sec Dwell = 192 sec (<i>cycle = 6 * 64 sec</i>)	60°	East
7. Windshield wiper scan between 45 and 135 el at -45 az Slew speed = 0.469 deg/sec Dwell = 192 sec (<i>cycle = 6 * 64 sec</i>)	90°	Meridian
8. Windshield wiper scan between 210 and 270 az at 30 el Slew speed = 0.313 deg/sec Dwell = 192 sec (<i>cycle = 6 * 64 sec</i>)	60°	West
9. Windshield wiper scan between -60 and 0 az at 30 el Slew speed = 0.313 deg/sec Dwell = 192 sec (<i>cycle = 6 * 64 sec</i>) > Set up 26 * 6.4 s on 32m antenna and 4 * 6.4s on 42m antenna	60°	North
10. Windshield wiper scan between 120 and 180 az at 30 el Slew speed = 0.313 deg/sec Dwell = 192 sec (<i>cycle = 6 * 64 sec</i>) > Set up 26 * 6.4 s on 32m antenna and 4 * 6.4s on 42m antenna	60°	South
11. Windshield wiper scan between 90 and 210 az at 30 el Slew speed = 0.469 deg/sec Dwell = 256 sec (<i>cycle = 8 * 64 sec</i>)	120°	Southeast

Date	Time started	Time stopped	Mode	Notes
January 15, 2001				First day using scanning modes, late start due to operating problems
	09:09:37 UT	11:14:51 UT	3	Mode 3, but with Dwell=126 sec.
January 16, 2001	06:03:12 UT	07:38:24 UT	4	
	07:47:41 UT	08:25:42 UT	7	
	08:34:22 UT	11:02:06 UT	3	Airport interlock from 09:10 to 09:21
January 17, 2001				Clear skies, nice aurora in the north
	06:01:05 UT	07:15:53 UT	1	
	07:19:44 UT	09:08:41 UT	2	Airport interlock from 09:05 to 09:15
	09:14:56 UT	10:52:04 UT	4	
				Airport interlock from 10:52 to 11:00
January 18, 2001				Bad weather, strong winds
	06:05:09 UT	07:34:46 UT	6	High system temperature in AC2
	07:38:55 UT	11:00:29 UT	2	
January 19, 2001	06:00:46 UT	07:58:10 UT	1	Wrong slew speed before 06:03
	08:02:24 UT	09:17:02 UT	2	Airport interlock from 08:50 to 09:10
				Airport interlock from 09:18 to 09:30
	09:31:35 UT	11:59:52 UT	4	Got extra time because of good geophysical conditions
January 20, 2001				Clear skies, some clouds in the north
	06:03:02 UT	07:17:33 UT	1	
	07:21:48 UT	09:51:07 UT	2	The weather got cloudy
	09:55:21 UT	11:00:07 UT	4	
January 25, 2001	18:00:29 UT	23:00:06 UT	11	Huge velocity shear in ion velocity, is that due to error in the transmitter???

Contents, November 24, 2000 :

-IMF-ACE plot

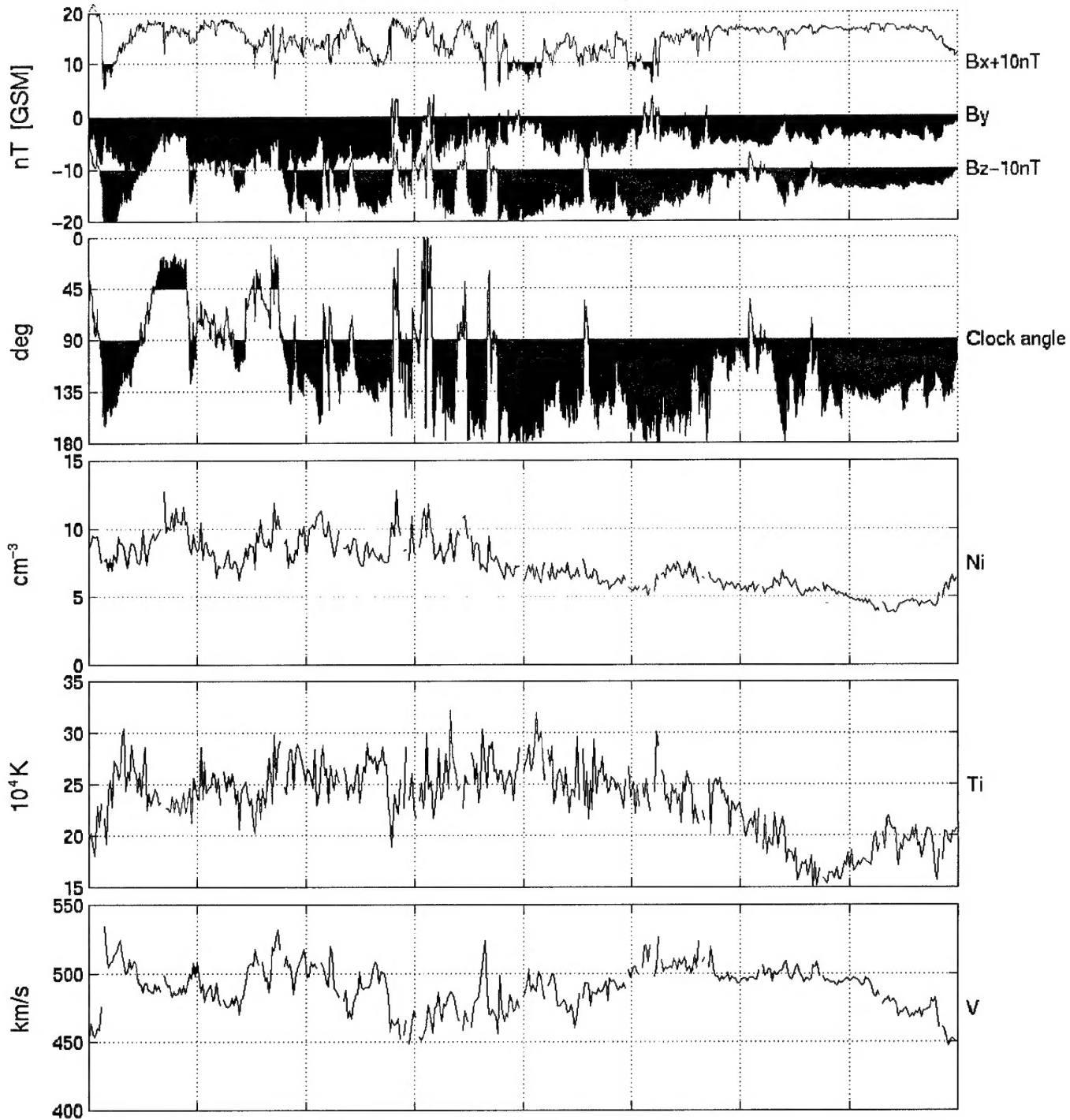
-EISCAT VHF(Tromsø) radar summary plots

-EISCAT Svalbard summary plots

-IMAGE magnetometer data

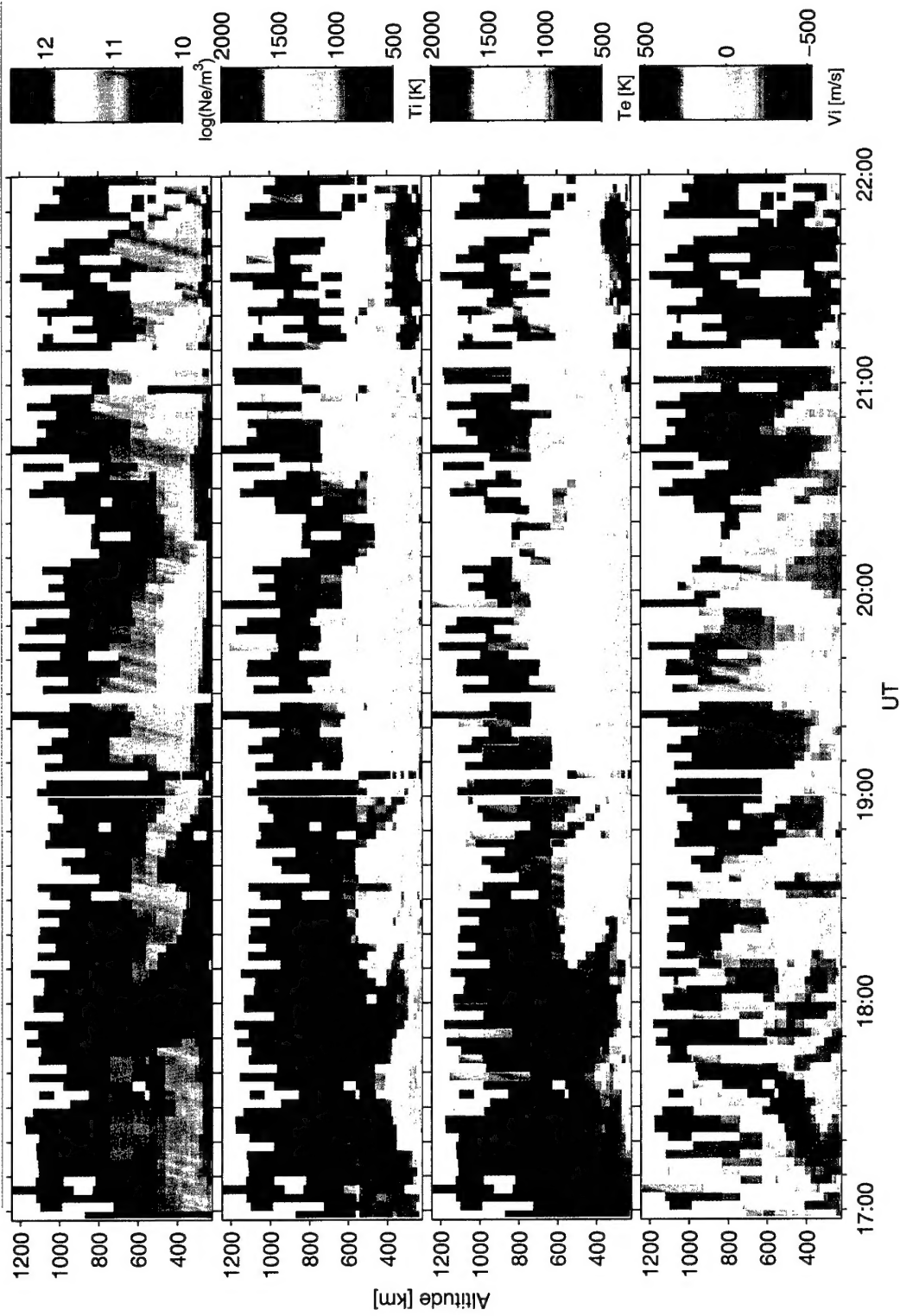
-CUTLASS Finland, Range-Time-Parameter plot

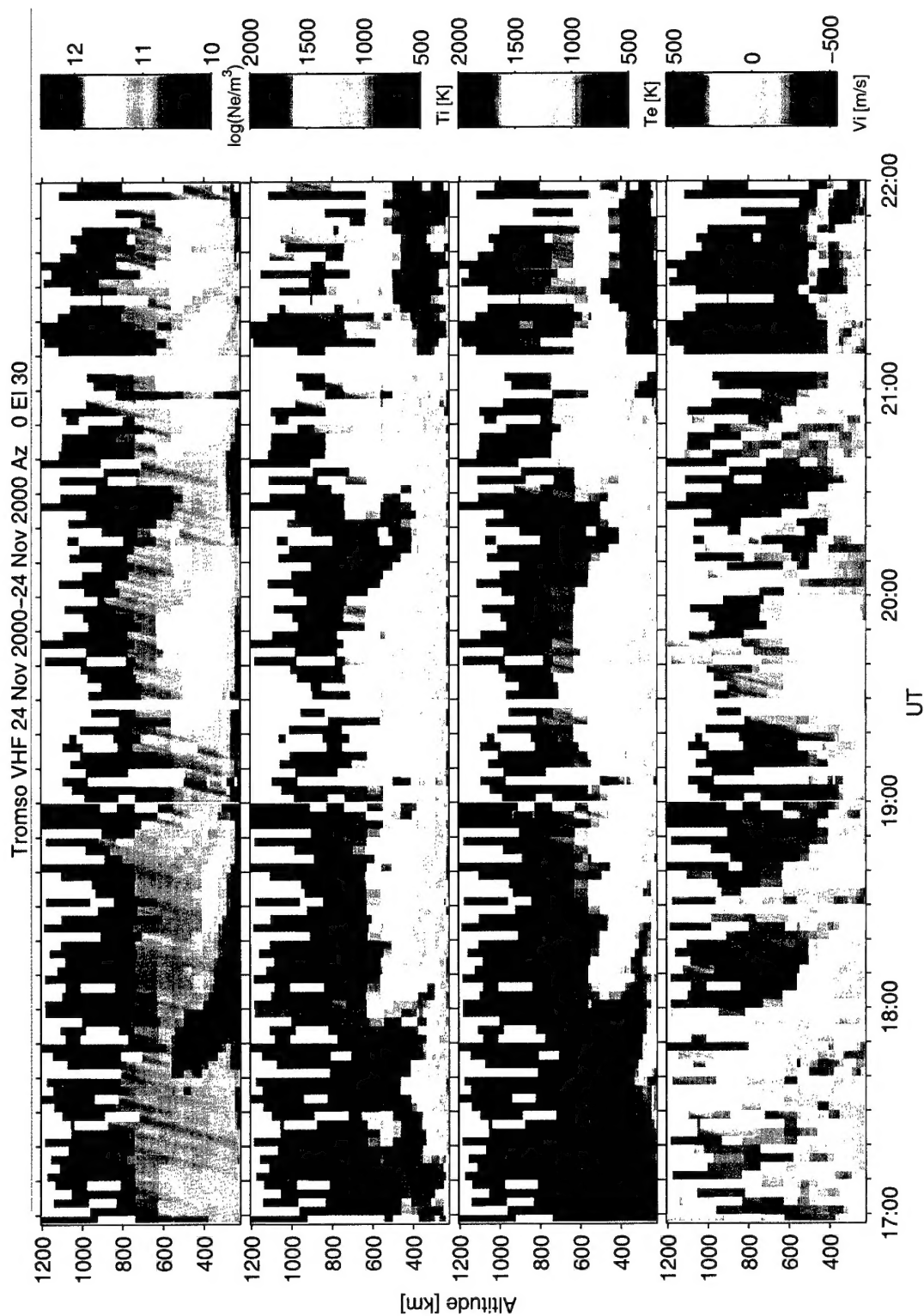
ACE: Solar Wind Parameters, Nov 24 2000



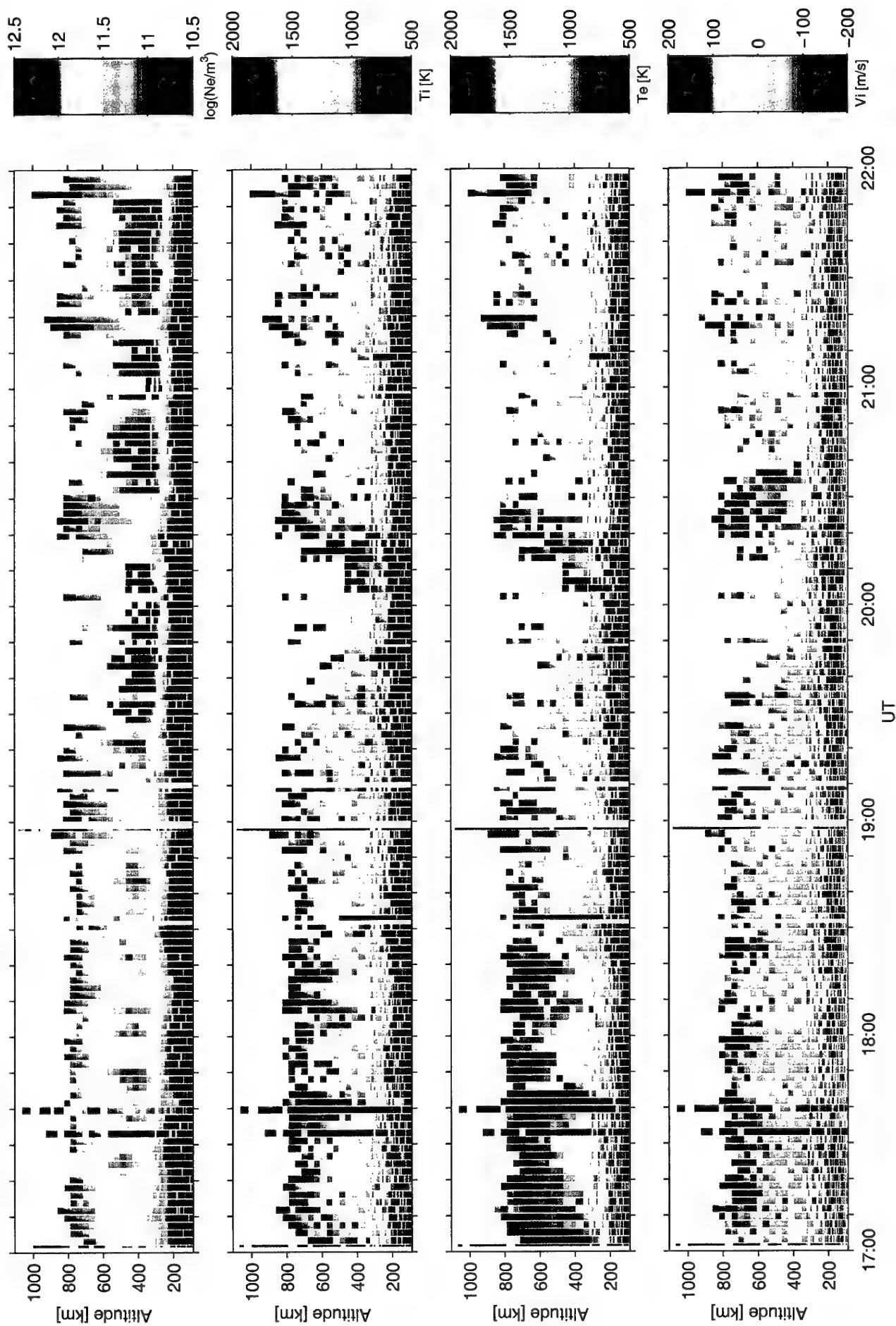
UT	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
X [GSM]	224.4	224.4	224.4	224.4	224.5	224.5	224.5	224.5	224.5
Y [GSM]	29.7	29.7	29.8	29.8	29.9	29.9	29.9	30.0	30.0
Z [GSM]	-24.1	-24.2	-24.1	-24.1	-24.1	-24.1	-24.0	-24.0	-24.0

Tromsø VHF 24 Nov 2000-24 Nov 2000 Az 0 El 30





NOTE: THE AZIMUTH ANGLE IS -15, NOT 0 AS INDICATED BY THE LABEL



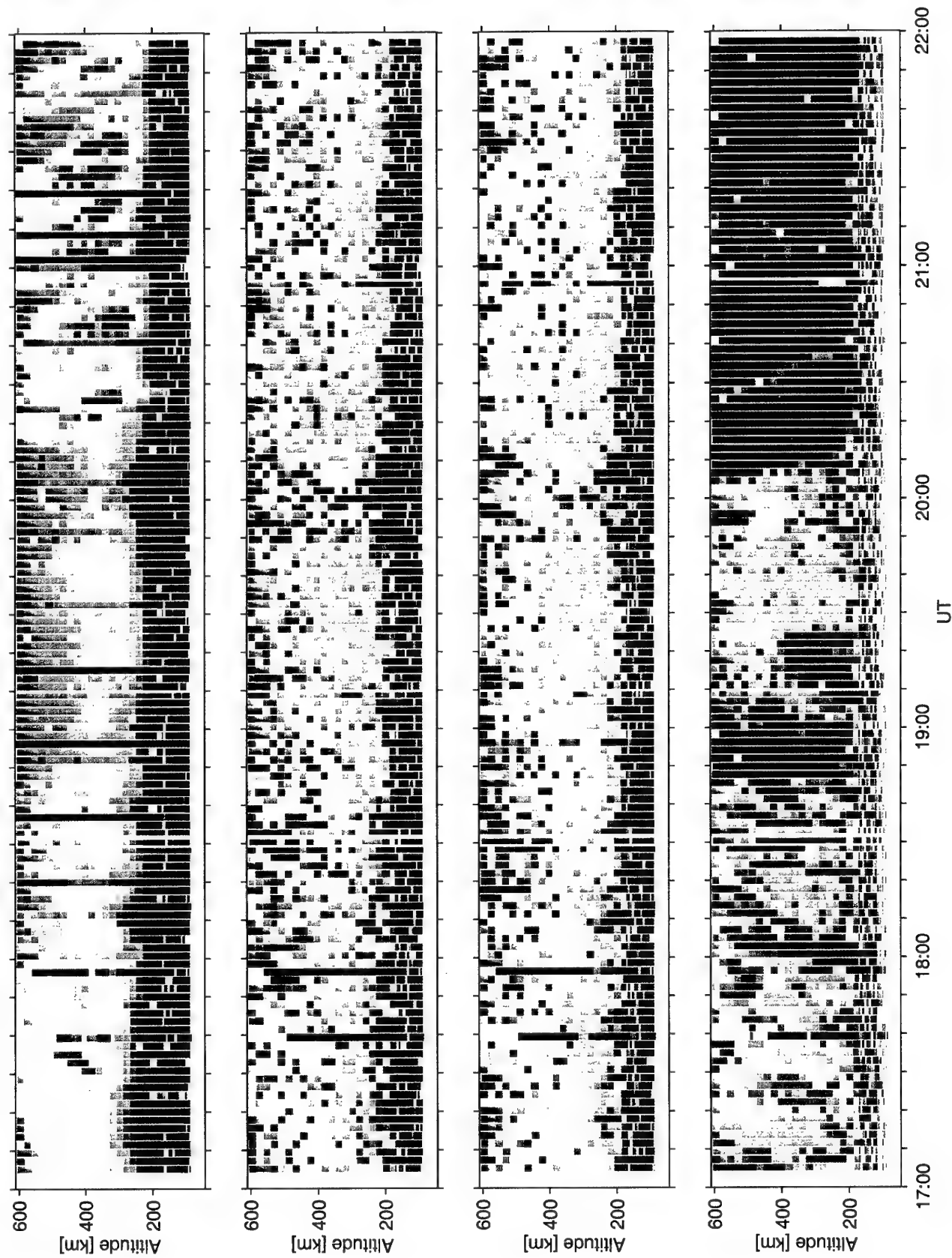
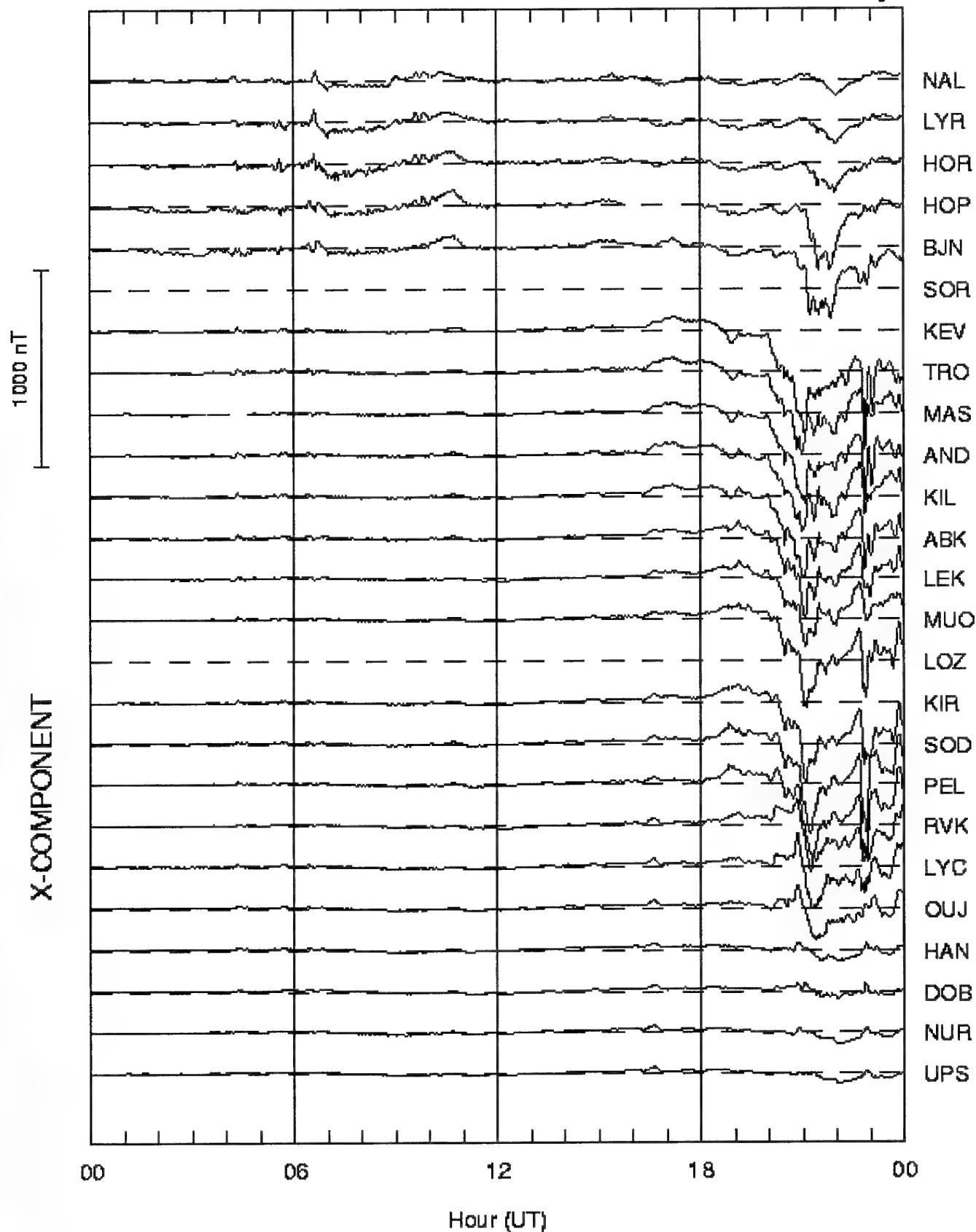


IMAGE magnetometer network 2000-11-24

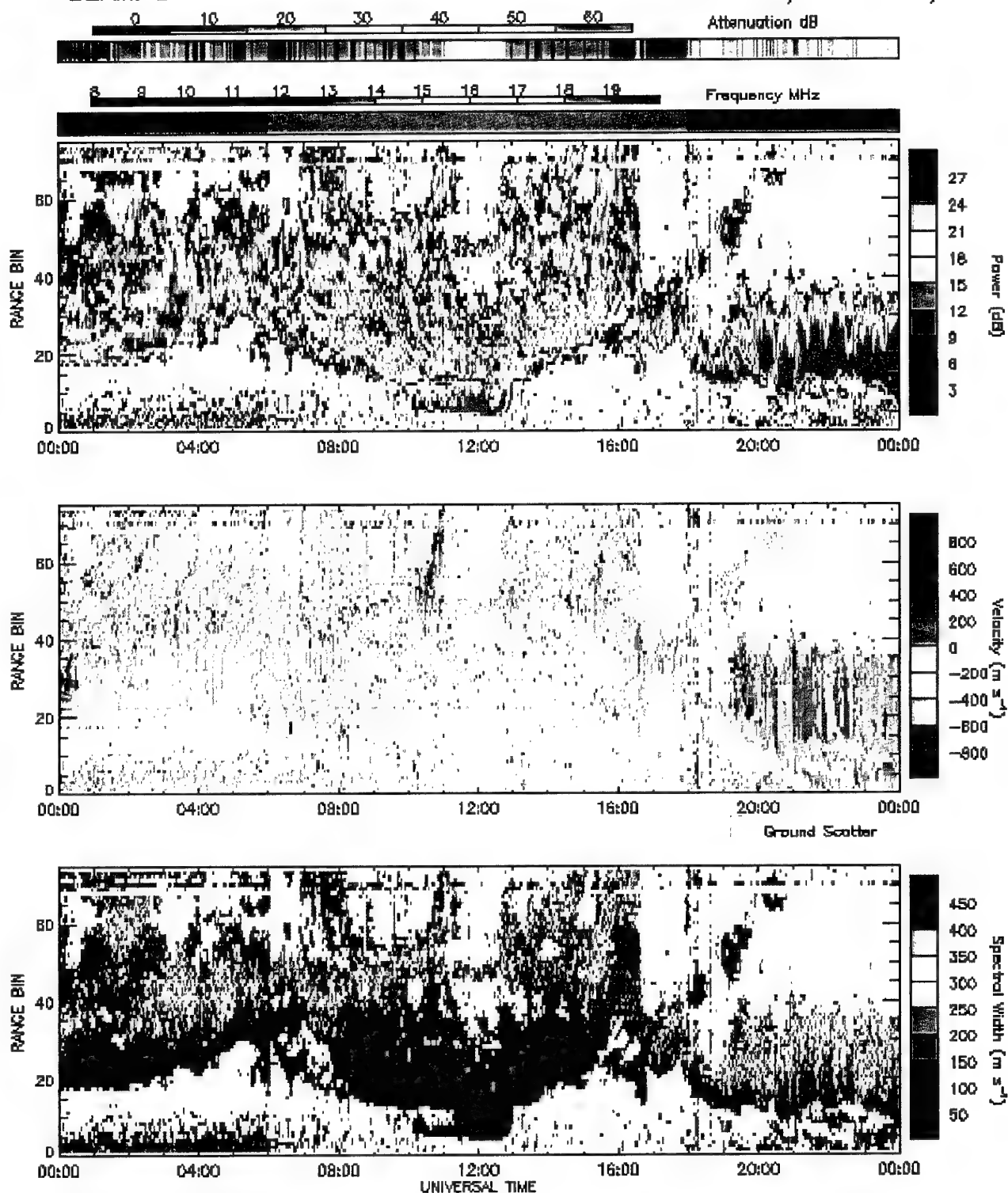
2 minute averages



CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

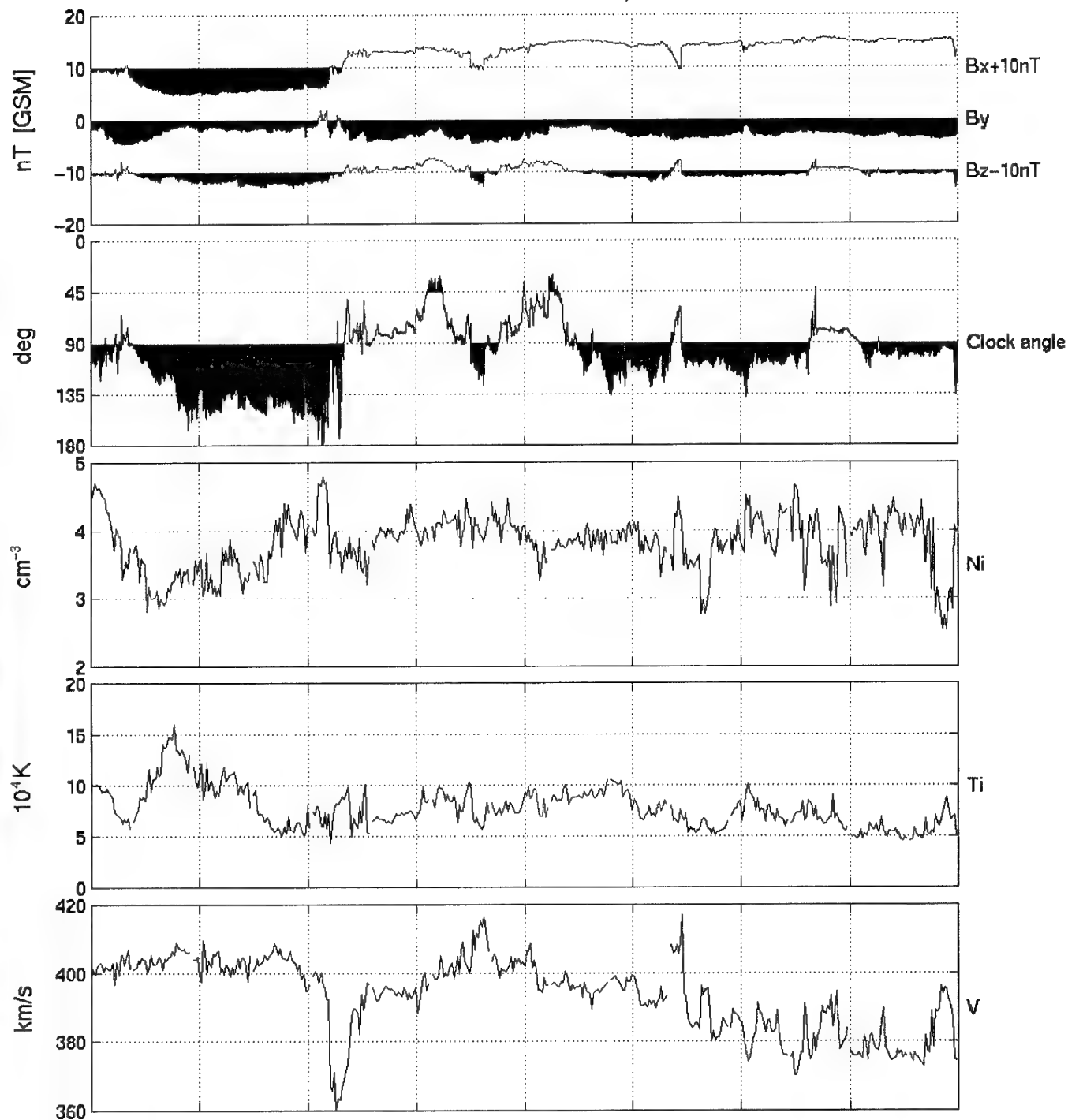
DATE: 24/November/2000



Contents, November 25, 2000 :

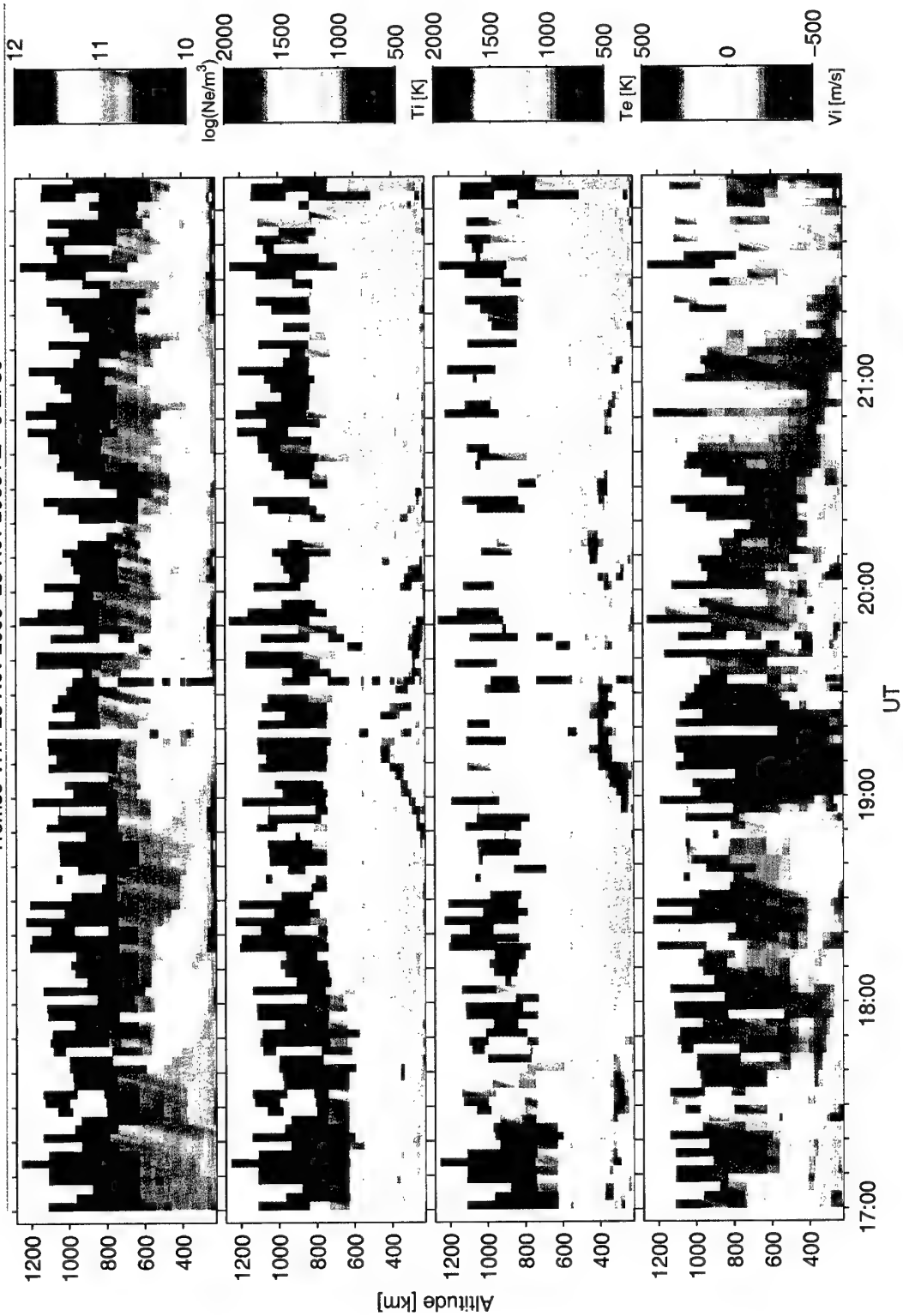
- IMF-ACE plot
- EISCAT VHF(Tromsø) radar summary plots
- EISCAT Svalbard summary plots
- IMAGE magnetometer data
- CUTLASS Finland, Range-Time-Parameter plot

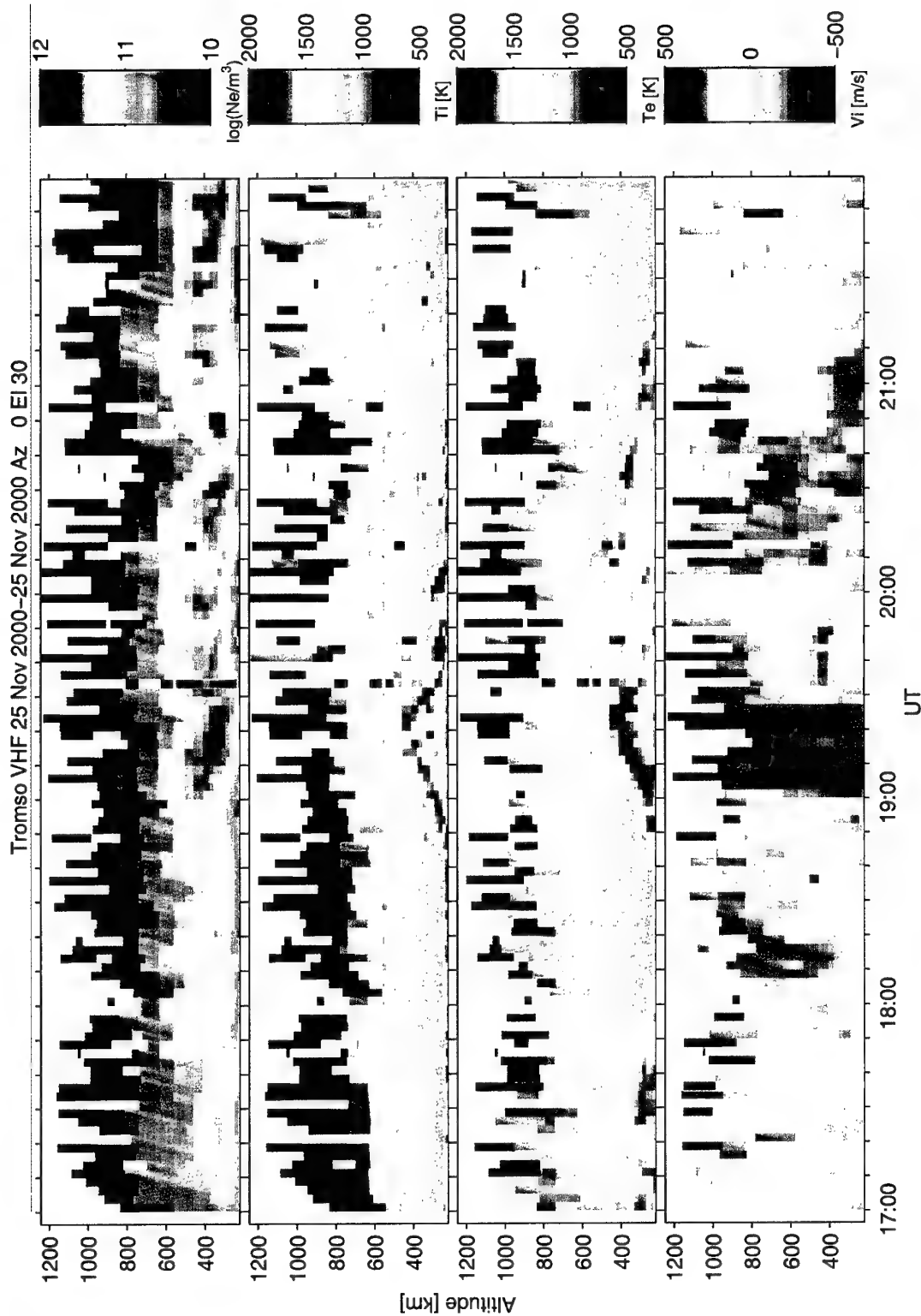
ACE: Solar Wind Parameters, Nov 25 2000



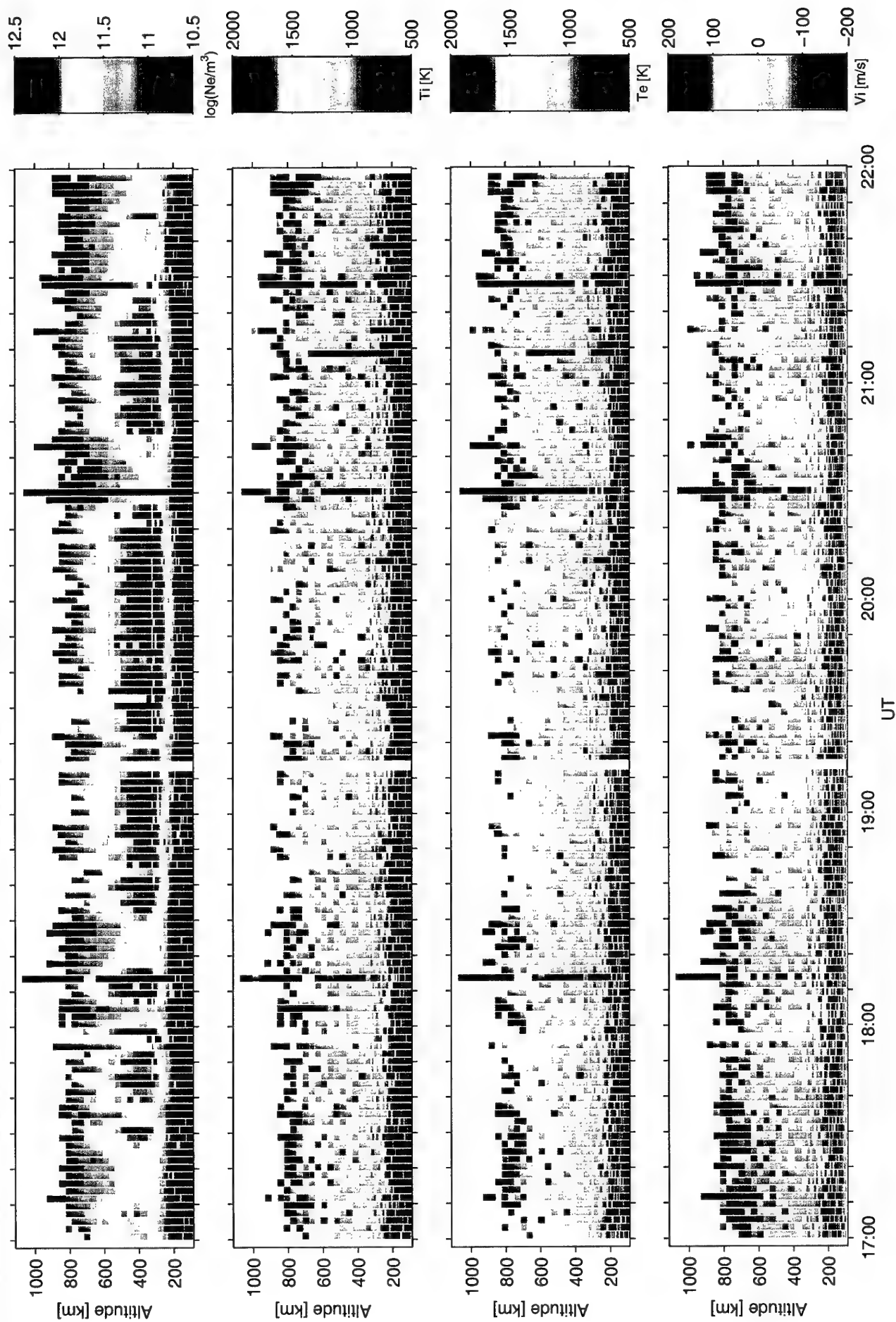
UT	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
X _[GSM]	224.8	224.8	224.8	224.8	224.8	224.8	224.8	224.9	224.9
Y _[GSM]	30.6	30.6	30.8	30.9	30.9	31.0	31.1	31.2	31.2
Z _[GSM]	-23.8	-23.8	-23.6	-23.5	-23.5	-23.4	-23.3	-23.3	-23.2

Tromso VHF 25 Nov 2000-25 Nov 2000 Az 0 El 30





NOTE: THE AZIMUTH ANGLE IS NOT 0, AS INDICATED BY THE LABEL, BUT -15



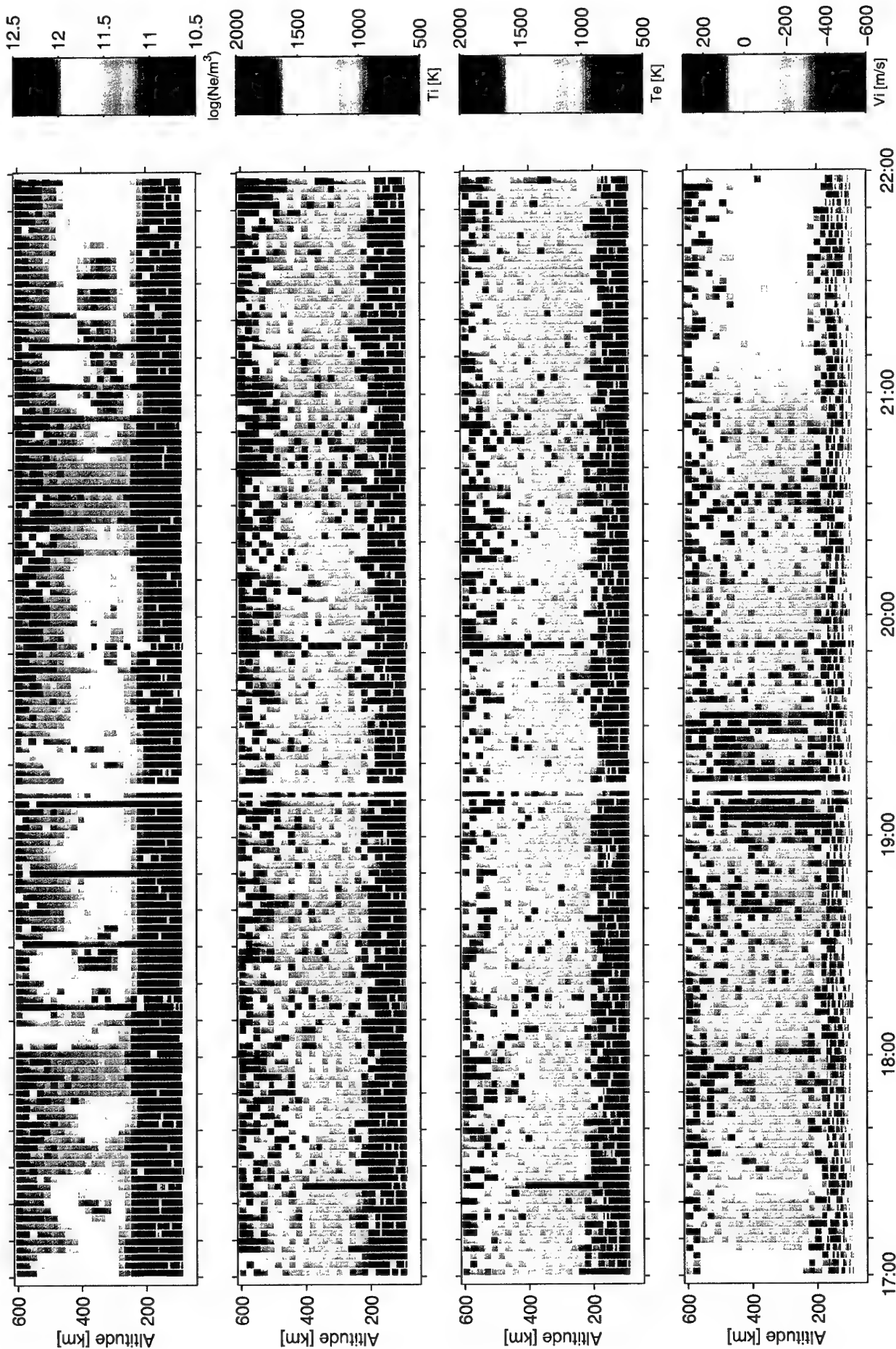
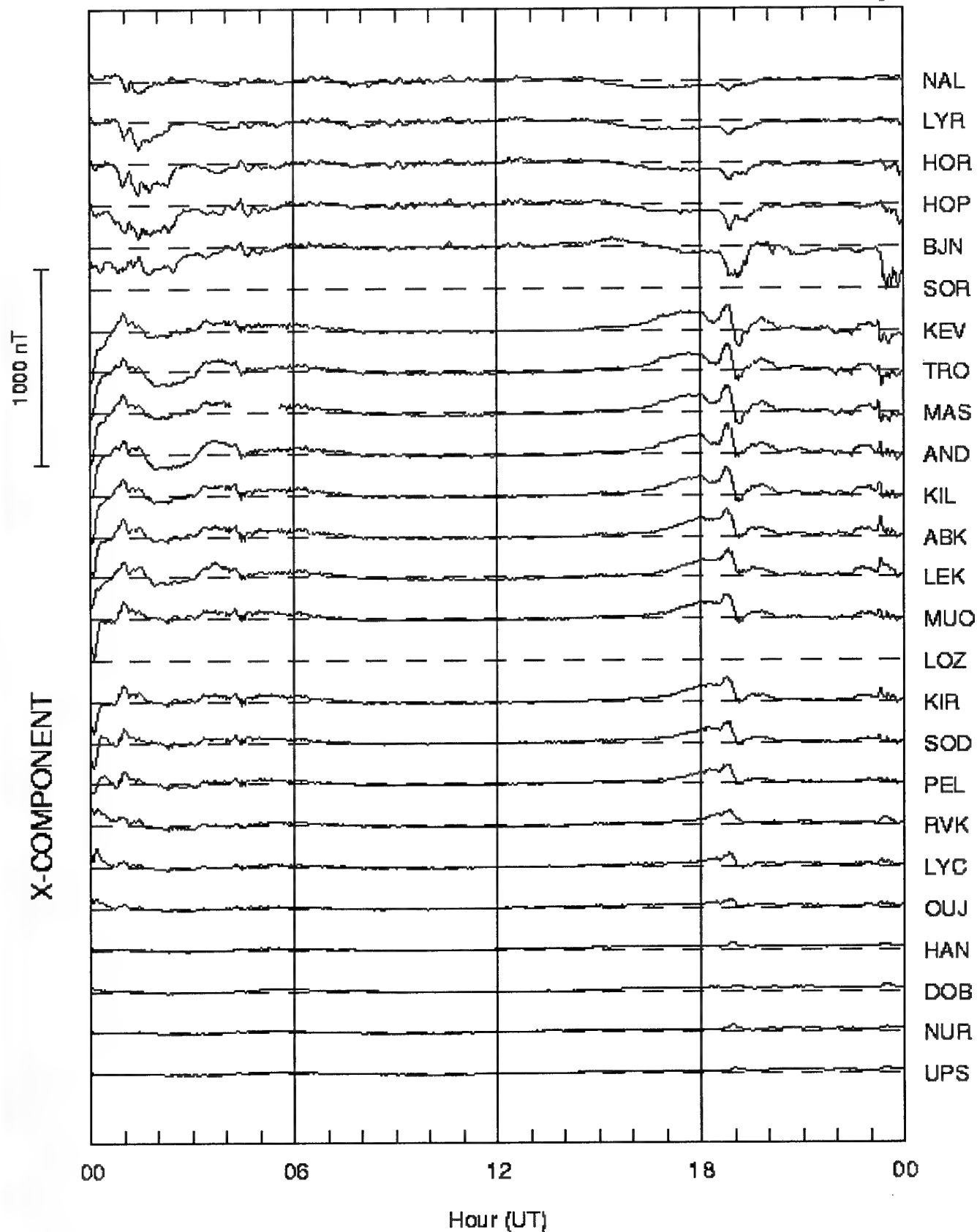


IMAGE magnetometer network 2000-11-25

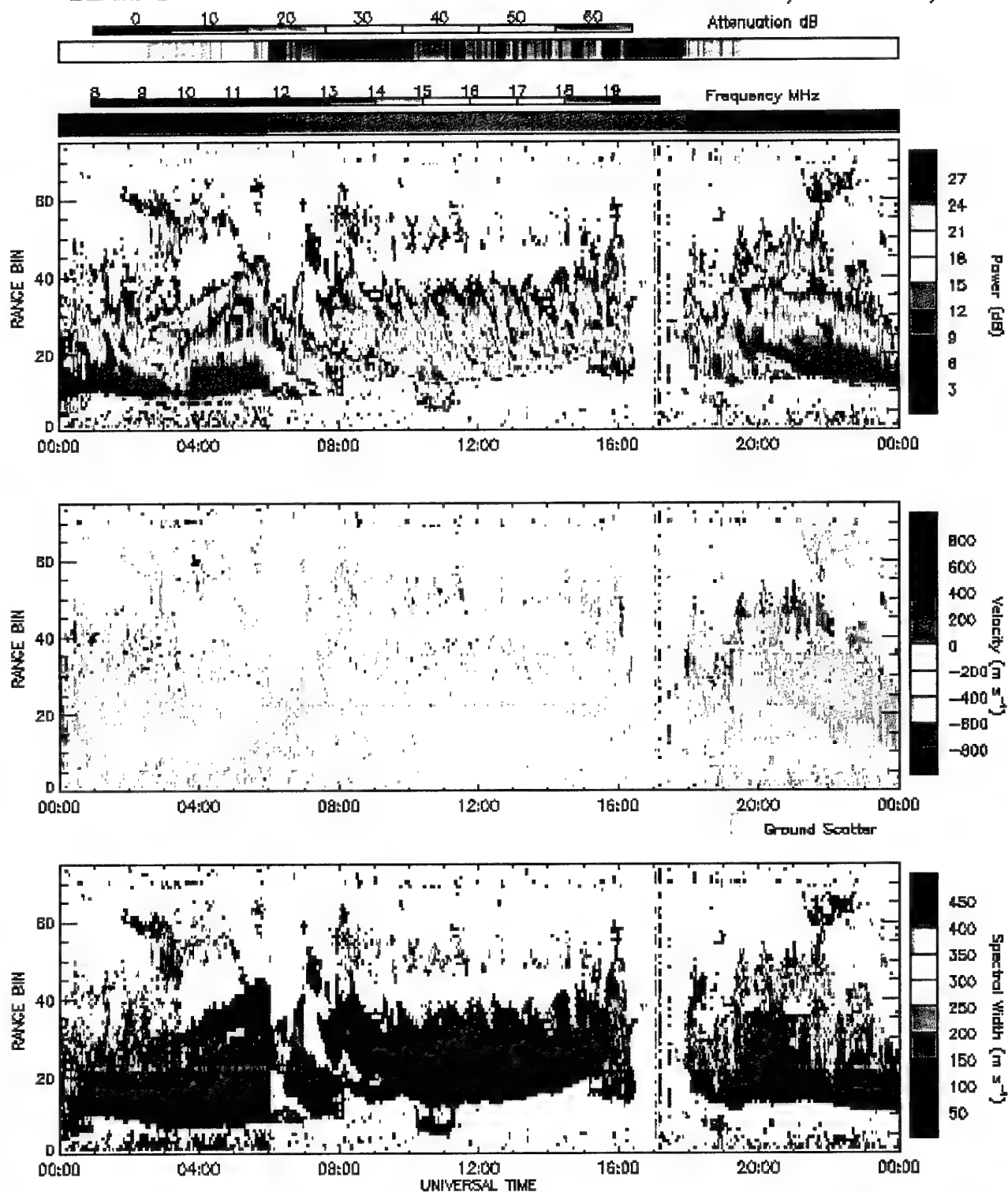
2 minute averages



CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

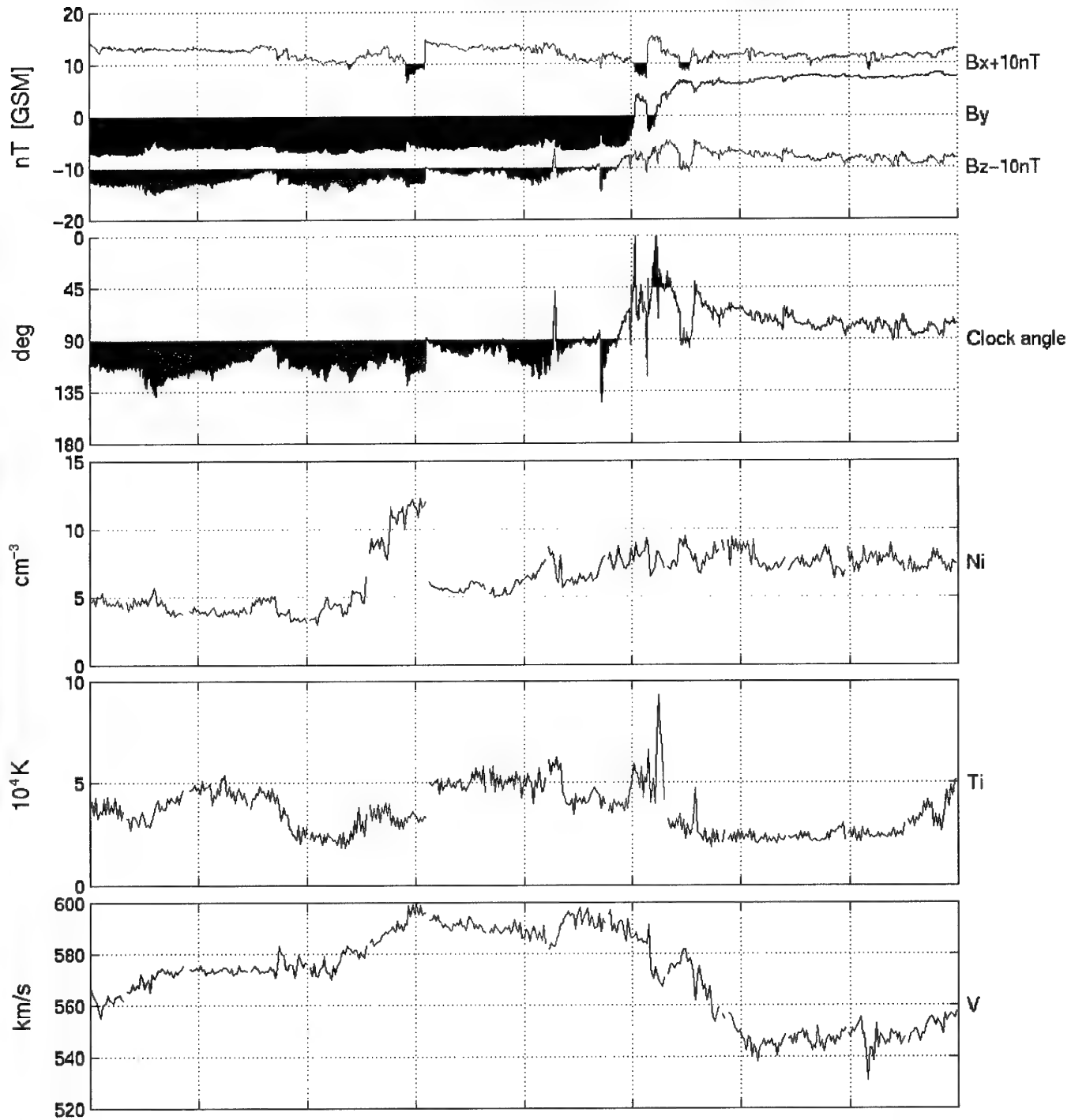
DATE: 25/November/2000



Contents, November 27, 2000 :

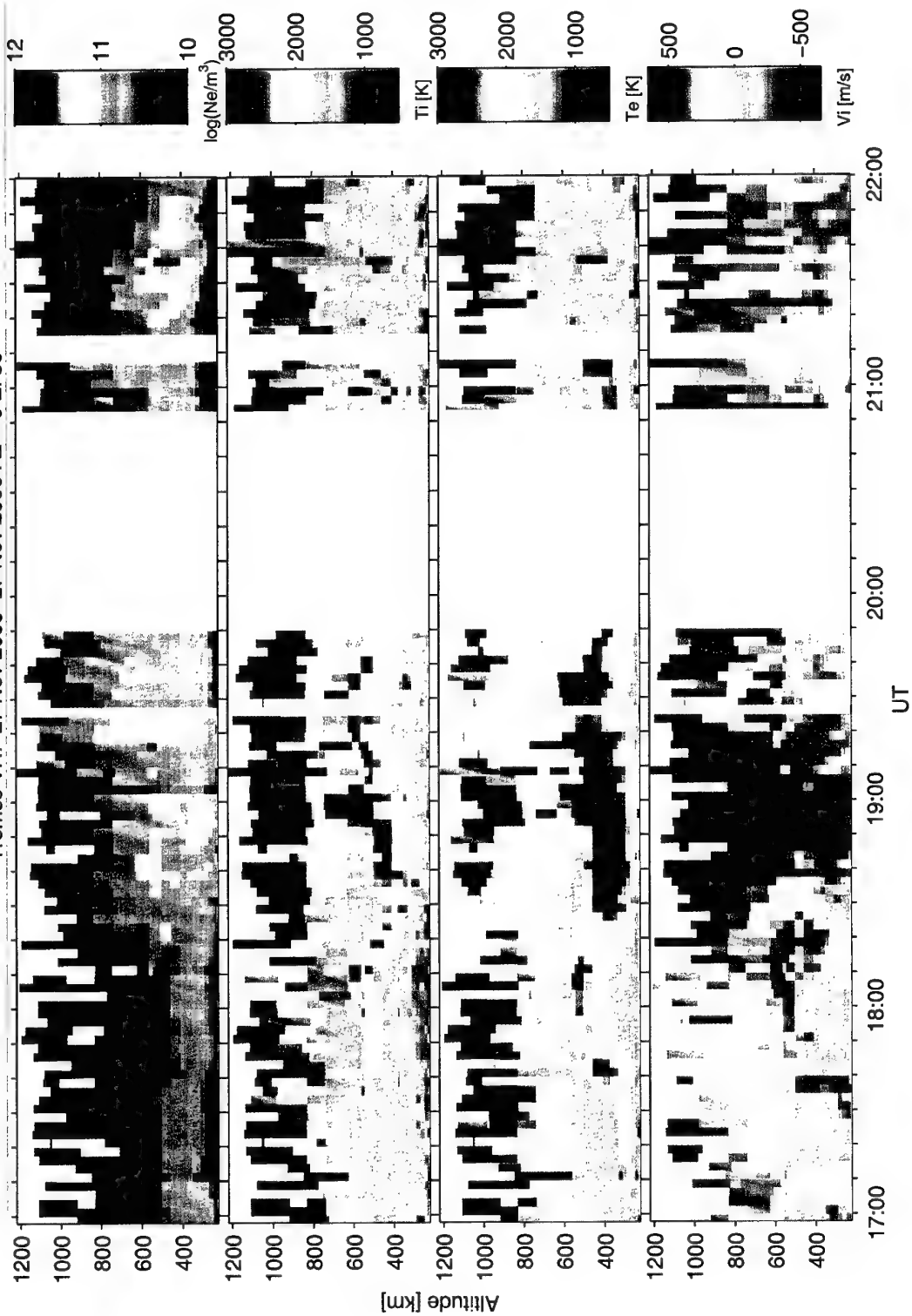
- IMF-ACE plot
- EISCAT VHF(Tromsø) radar summary plots
- EISCAT Svalbard summary plots
- IMAGE magnetometer data
- CUTLASS Finland, Range-Time-Parameter plot

ACE: Solar Wind Parameters, Nov 27 2000

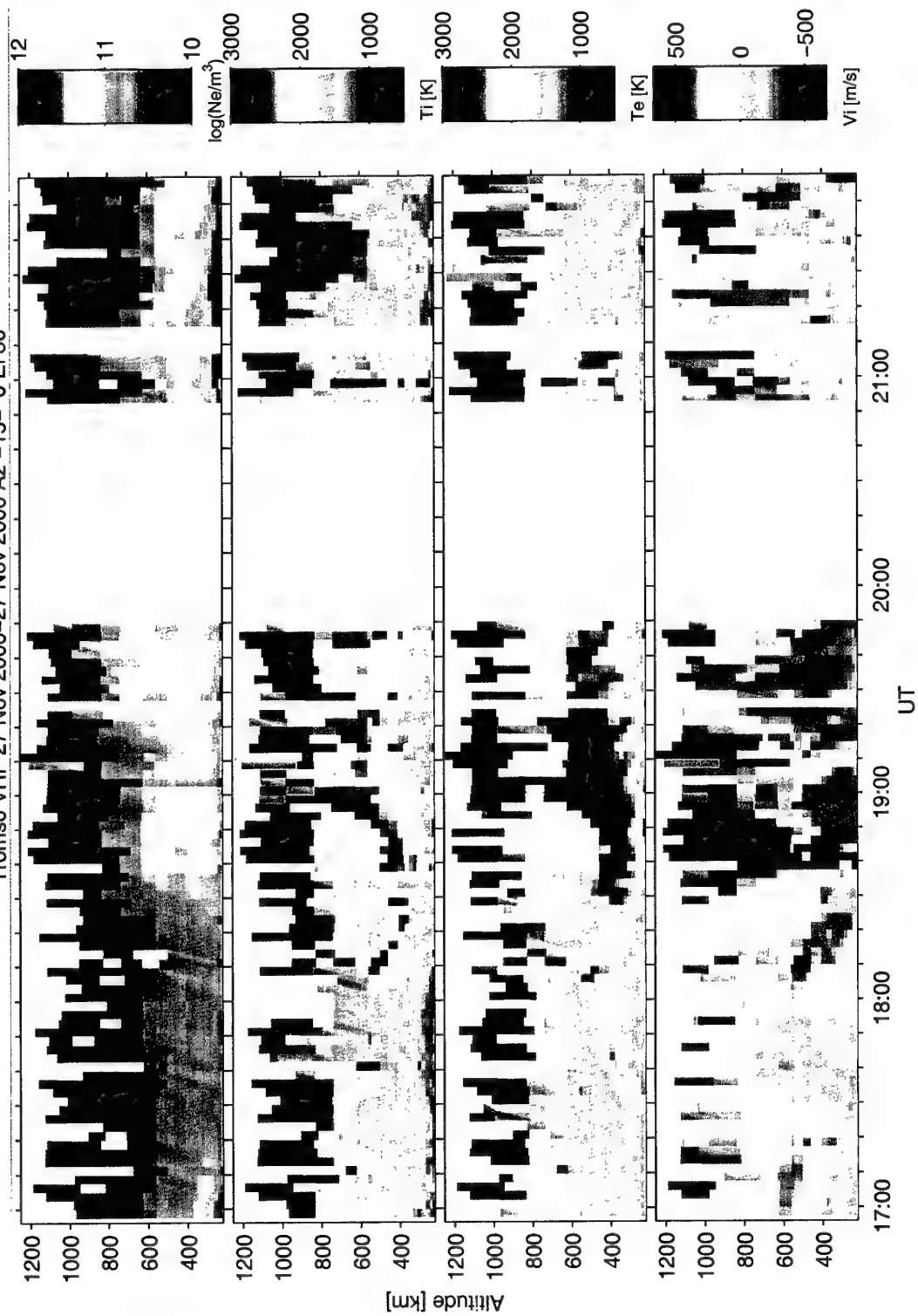


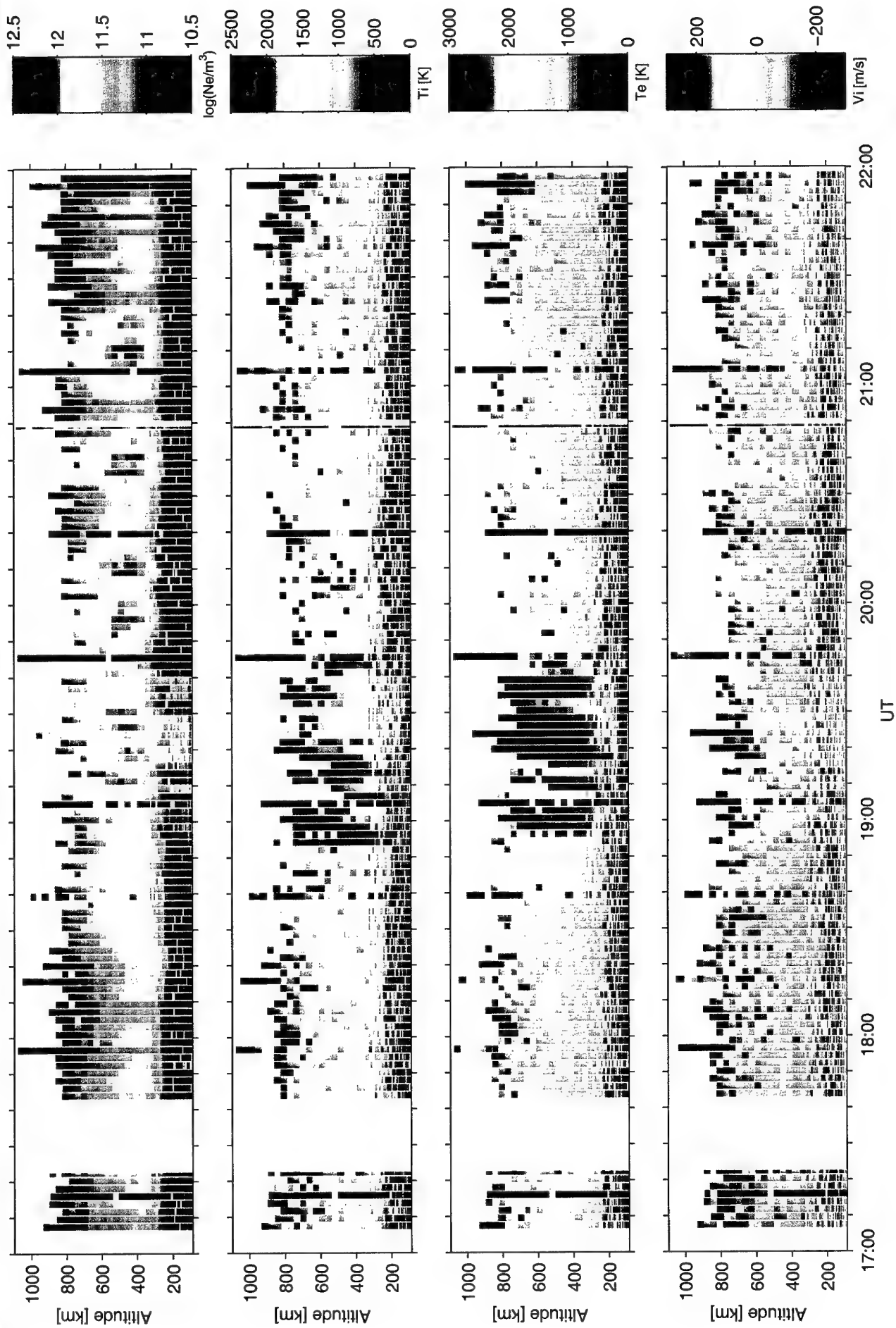
UT	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
X	225.4	225.4	225.5	225.5	225.5	225.5	225.5	225.5	225.5
Y	31.7	31.8	31.9	32.0	32.2	32.3	32.4	32.5	32.7
Z	-23.8	-23.8	-23.6	-23.4	-23.2	-23.1	-22.9	-22.7	-22.6

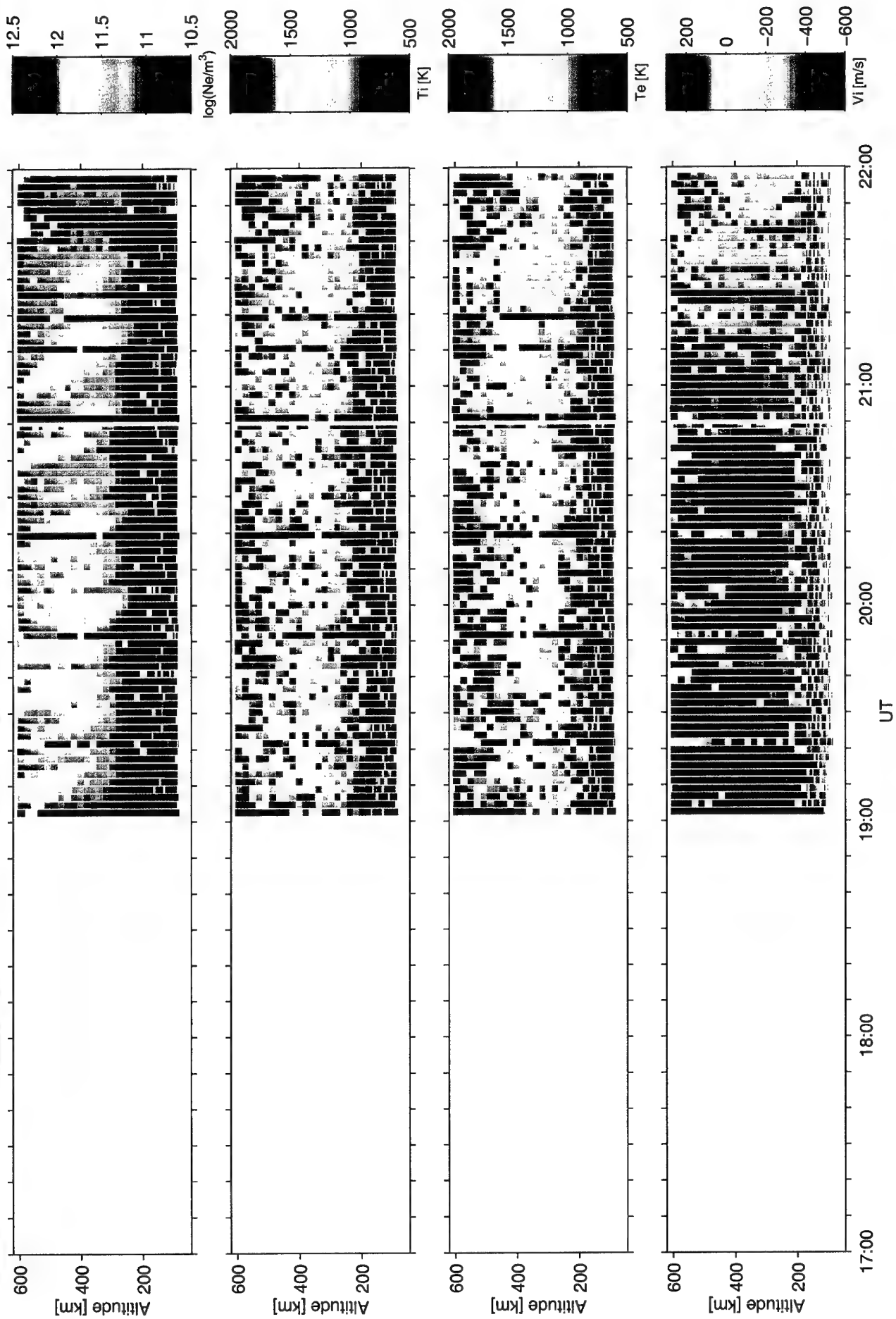
Tromsø VHF 27 Nov 2000-27 Nov 2000 Az -0 El 30



Tromsø VHF 27 Nov 2000-27 Nov 2000 Az -15- 0 El 30







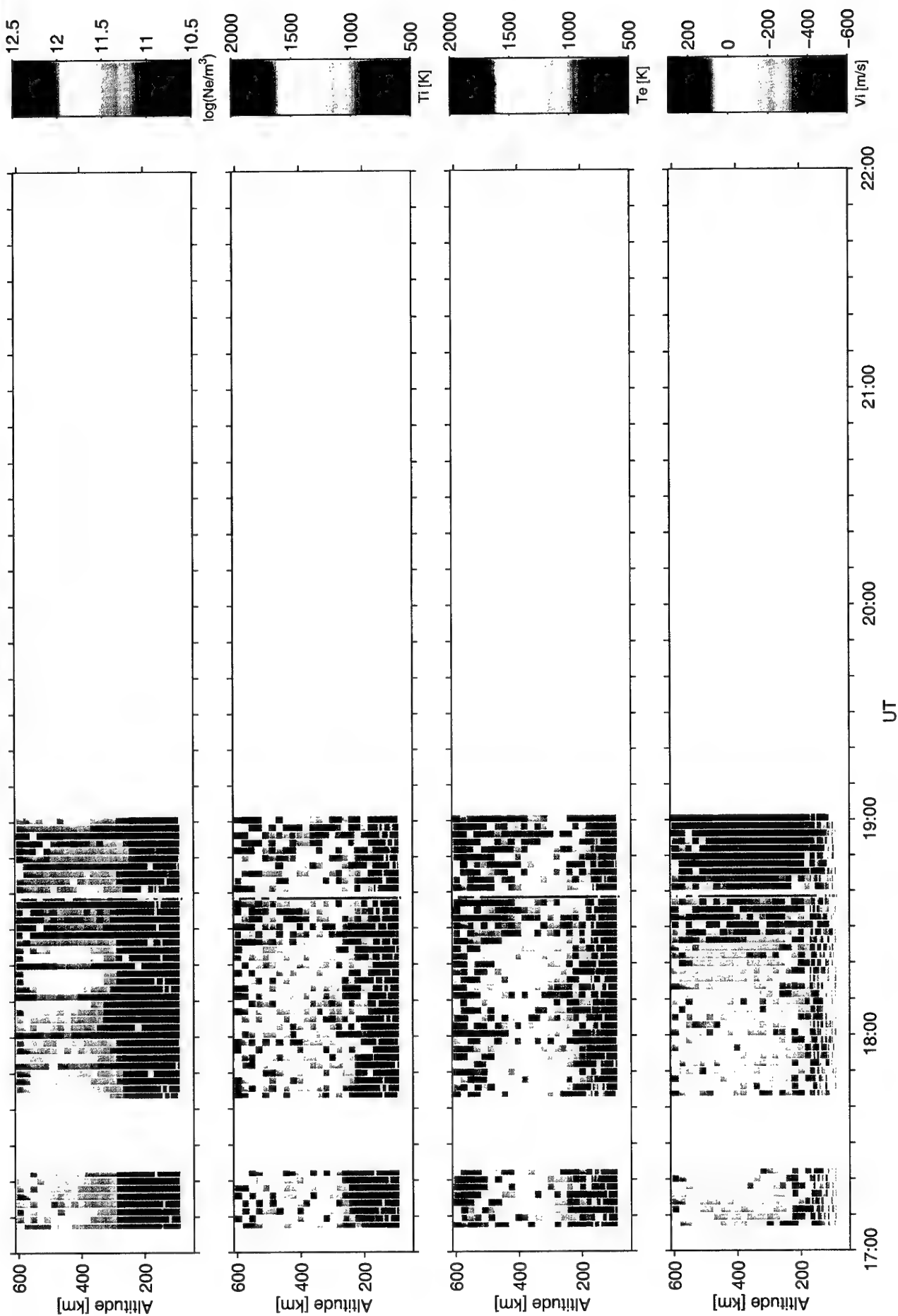
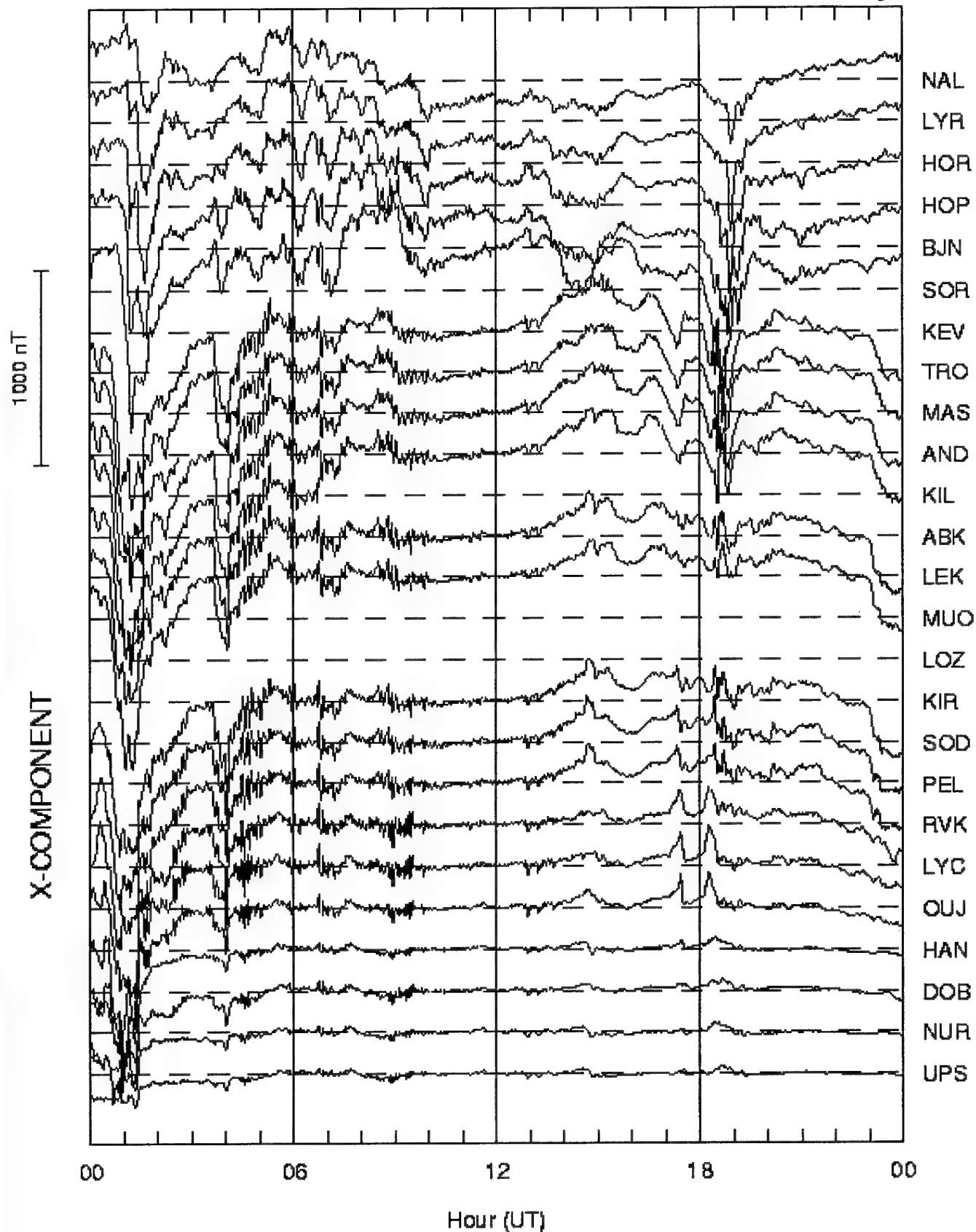


IMAGE magnetometer network 2000-11-27

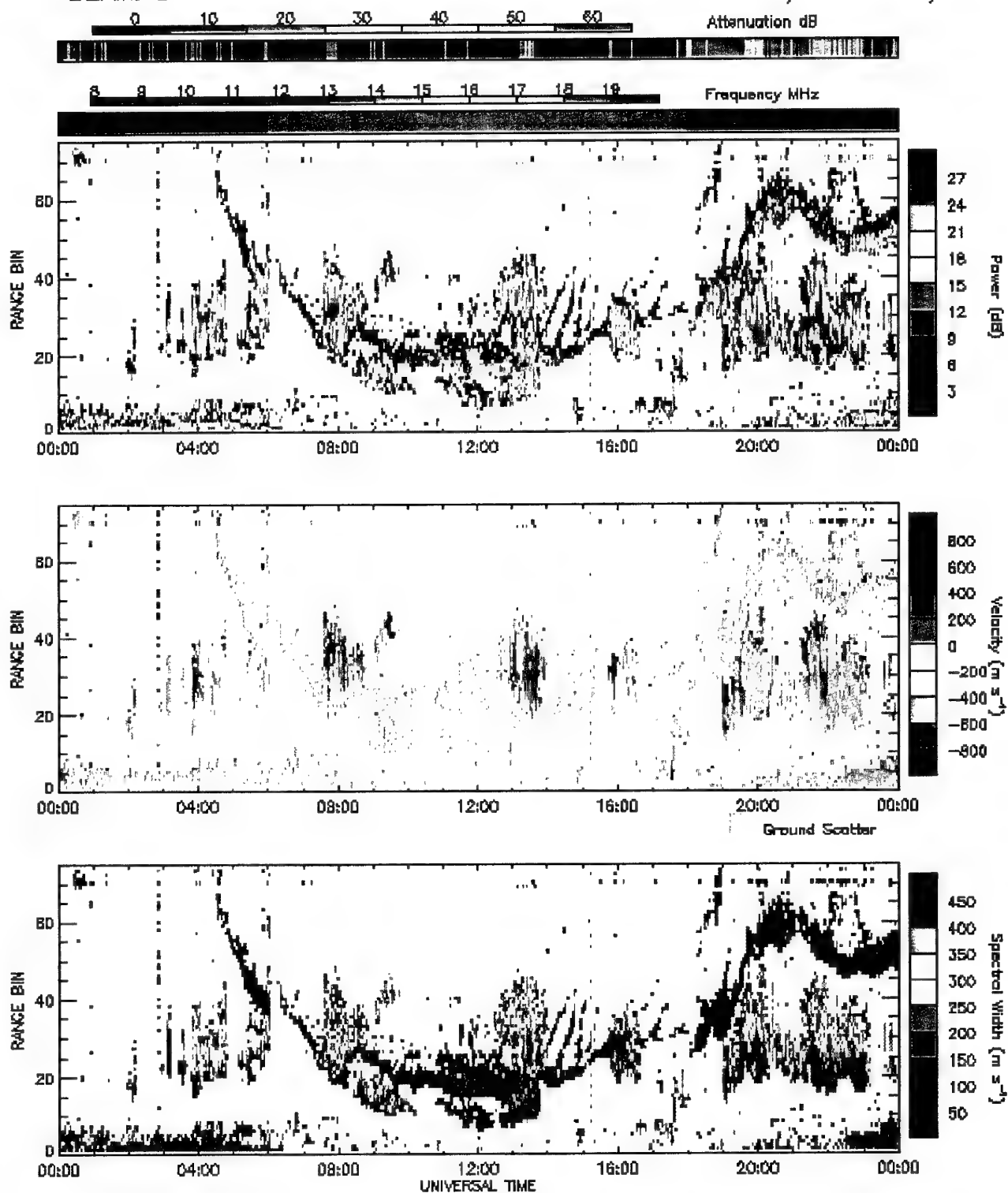
2 minute averages



CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 27/November/2000



Contents, November 28, 2000 :

-IMF-ACE plot

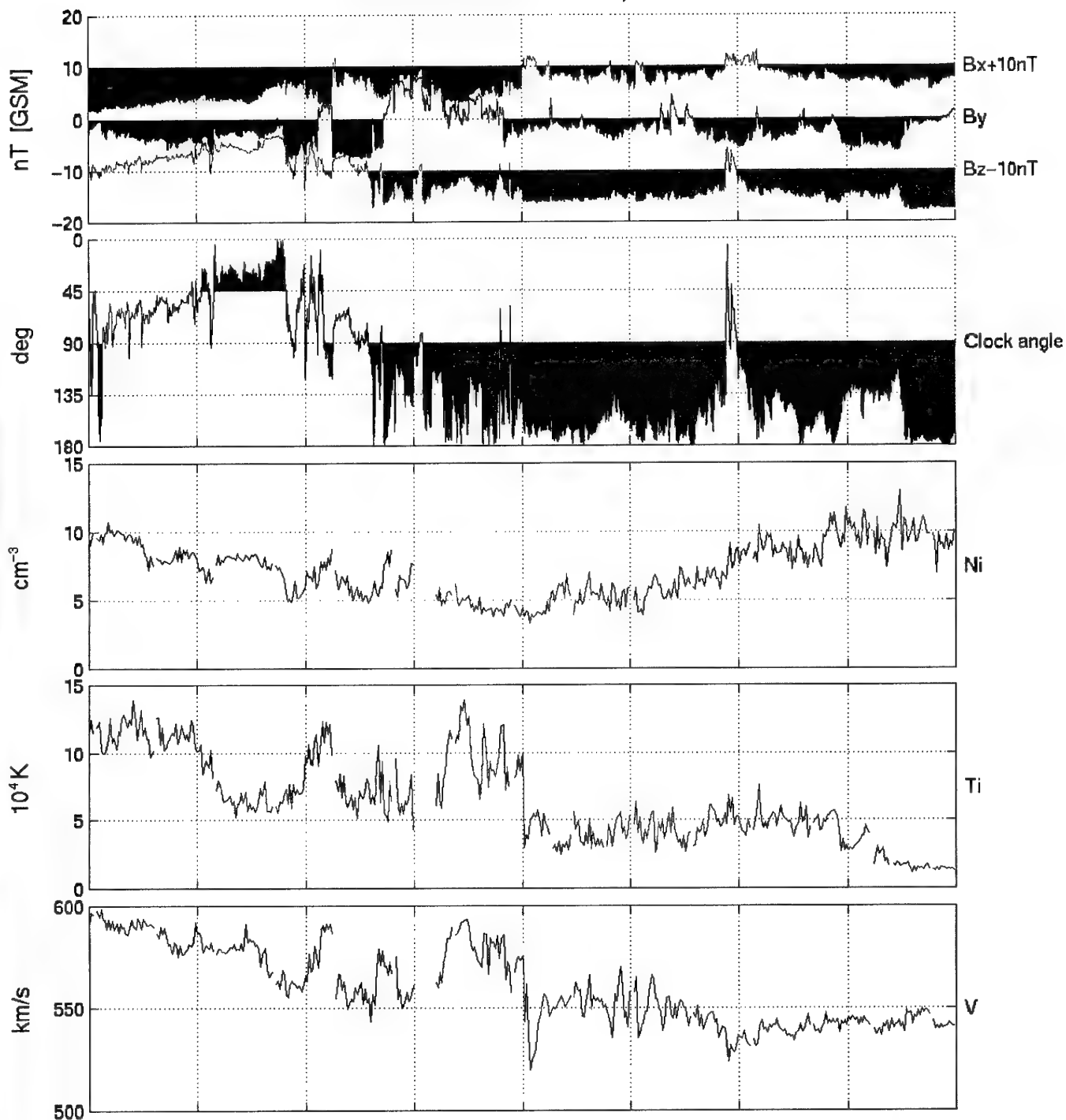
-EISCAT VHF(Tromsø) radar summary plots

-EISCAT Svalbard summary plots

-IMAGE magnetometer data

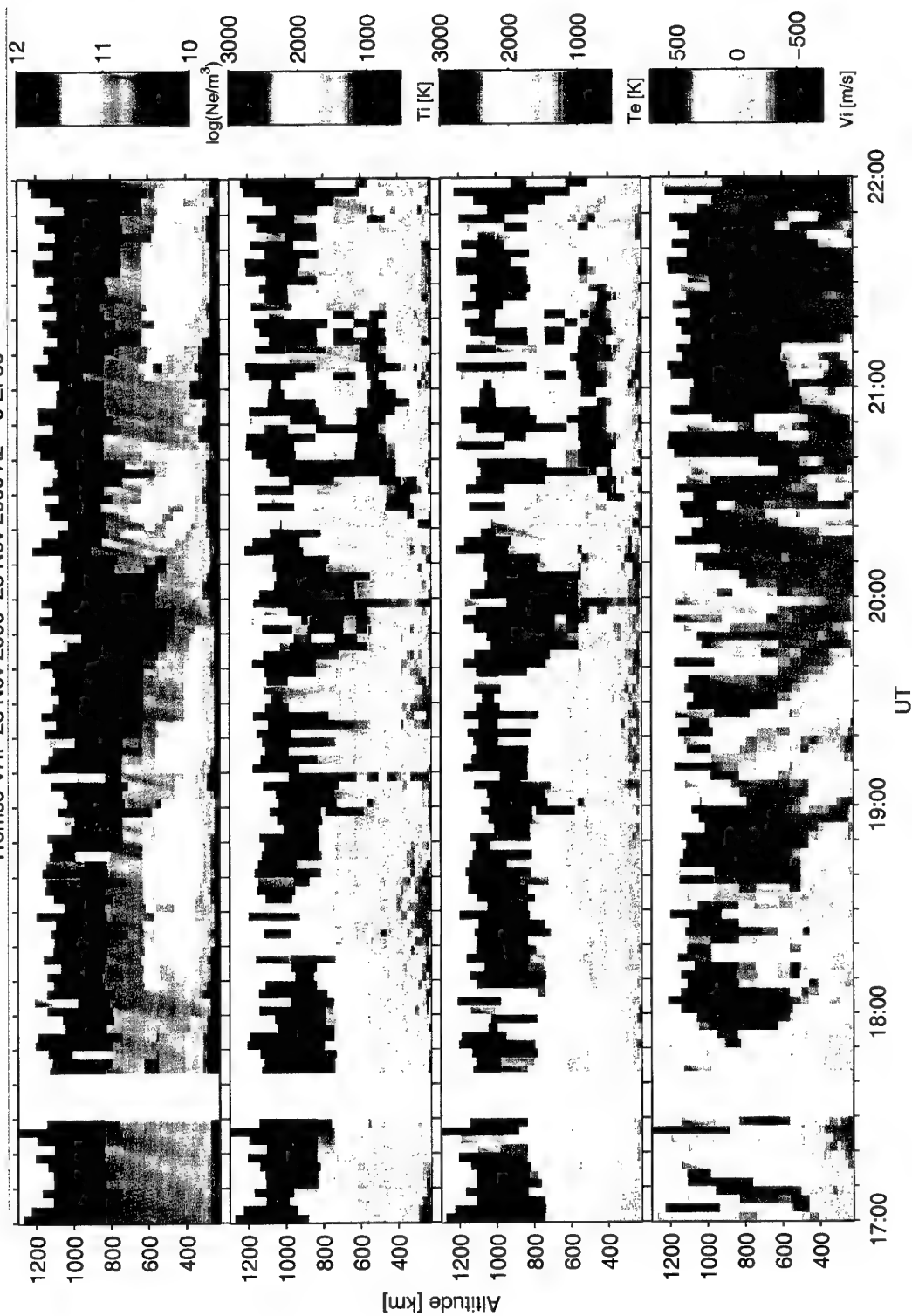
-CUTLASS Finland, Range-Time-Parameter plot

ACE: Solar Wind Parameters, Nov 28 2000

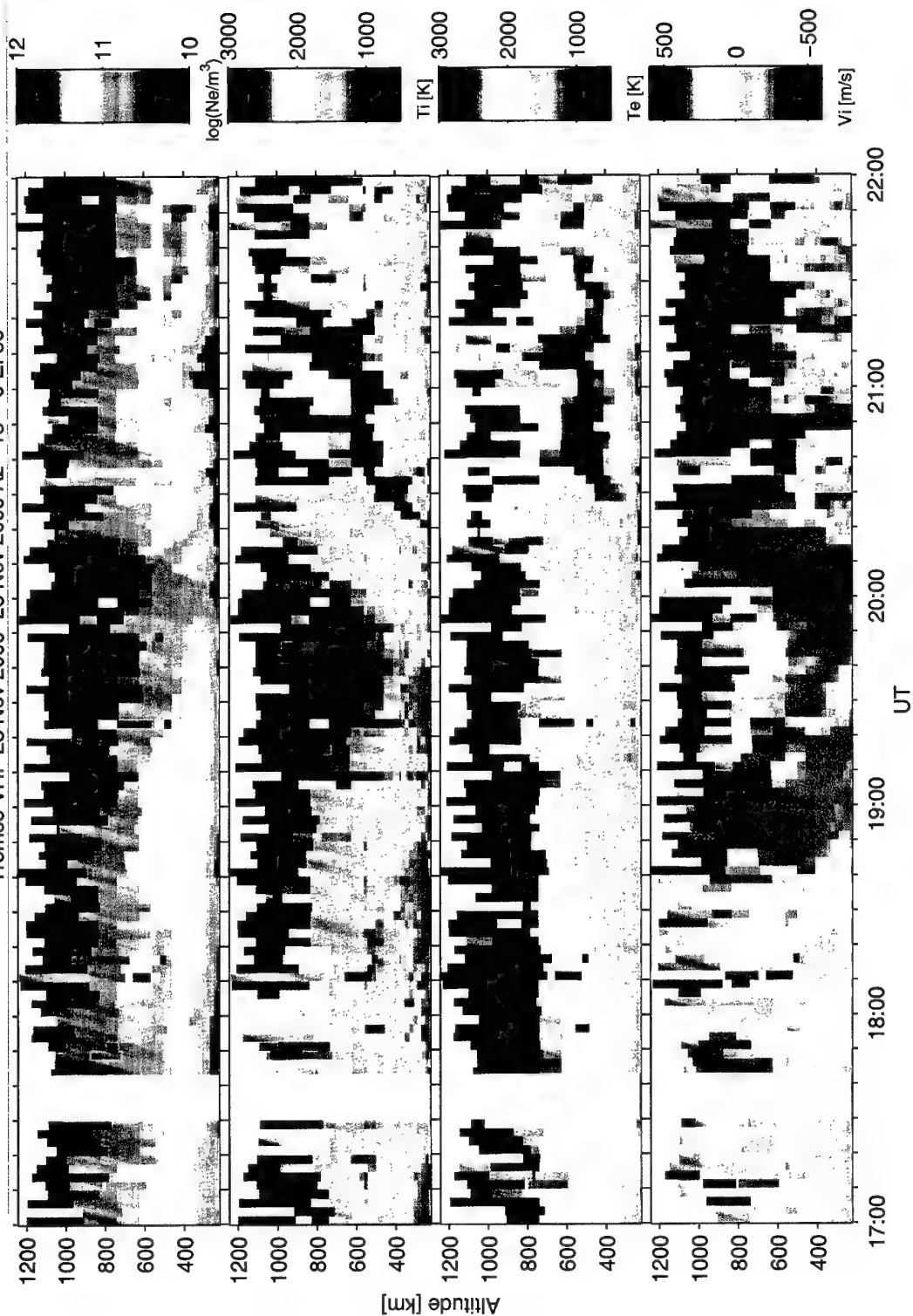


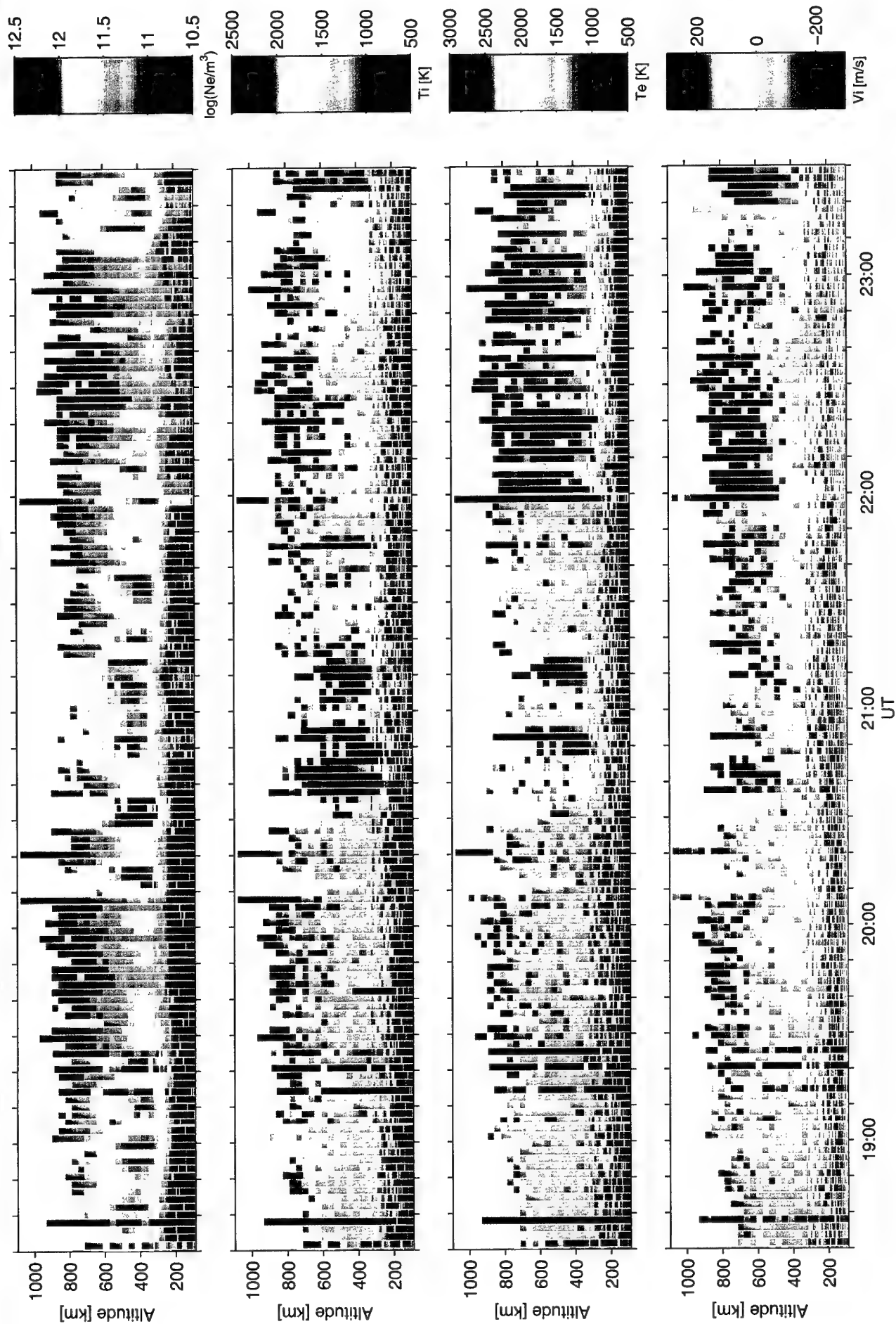
UT	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
X [GSM]	225.7	225.7	225.8	225.8	225.8	225.8	225.8	225.8	225.8
Y [GSM]	34.7	34.9	35.0	35.3	35.4	35.2	35.0	34.8	34.5
Z [GSM]	-19.8	-19.7	-19.5	-19.0	-18.7	-19.1	-19.5	-19.8	-20.2

Tromso VHF 28 Nov 2000-28 Nov 2000 Az -0 El 30



Tromsø VHF 28 Nov 2000-28 Nov 2000 Az -15- 0 El 30





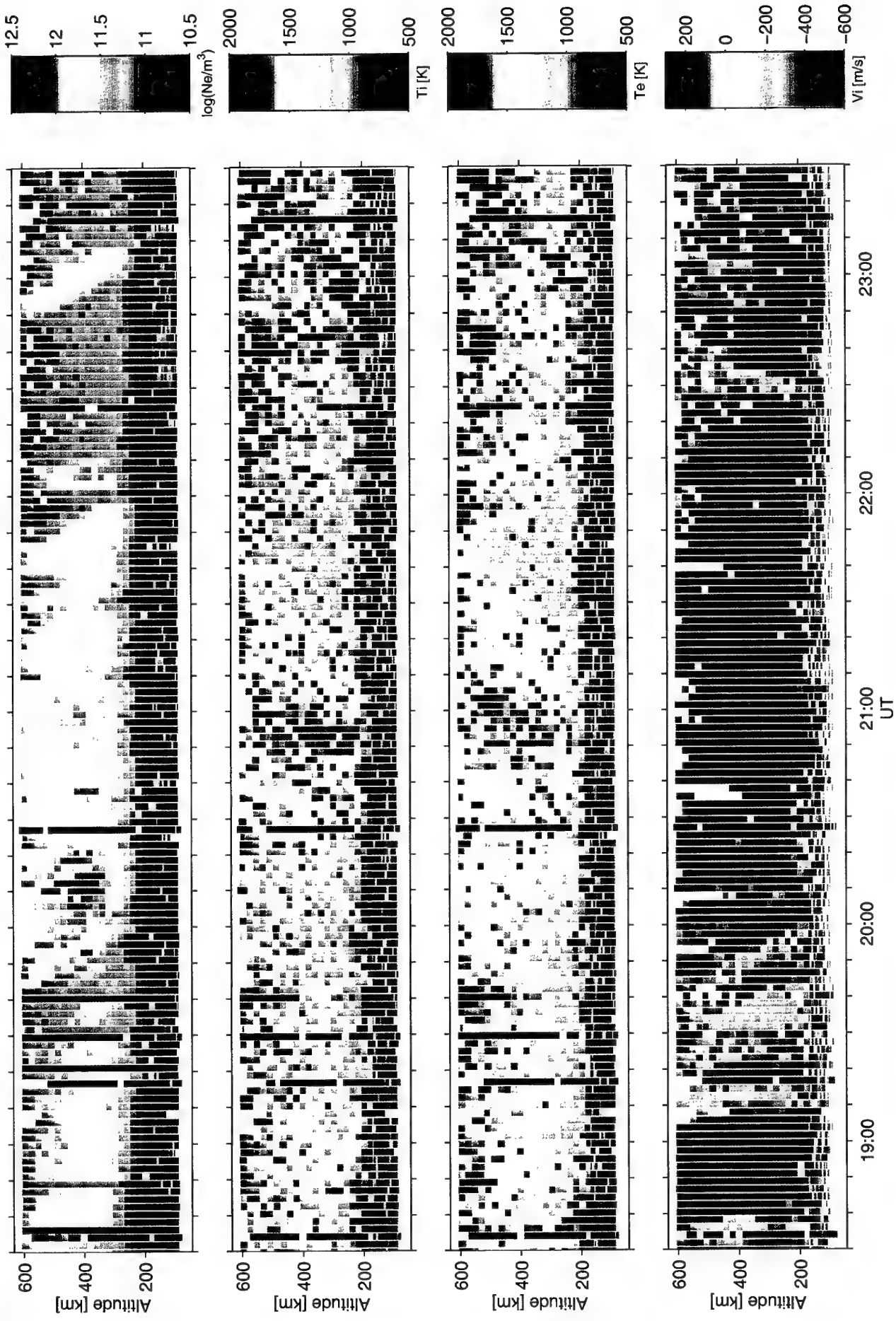
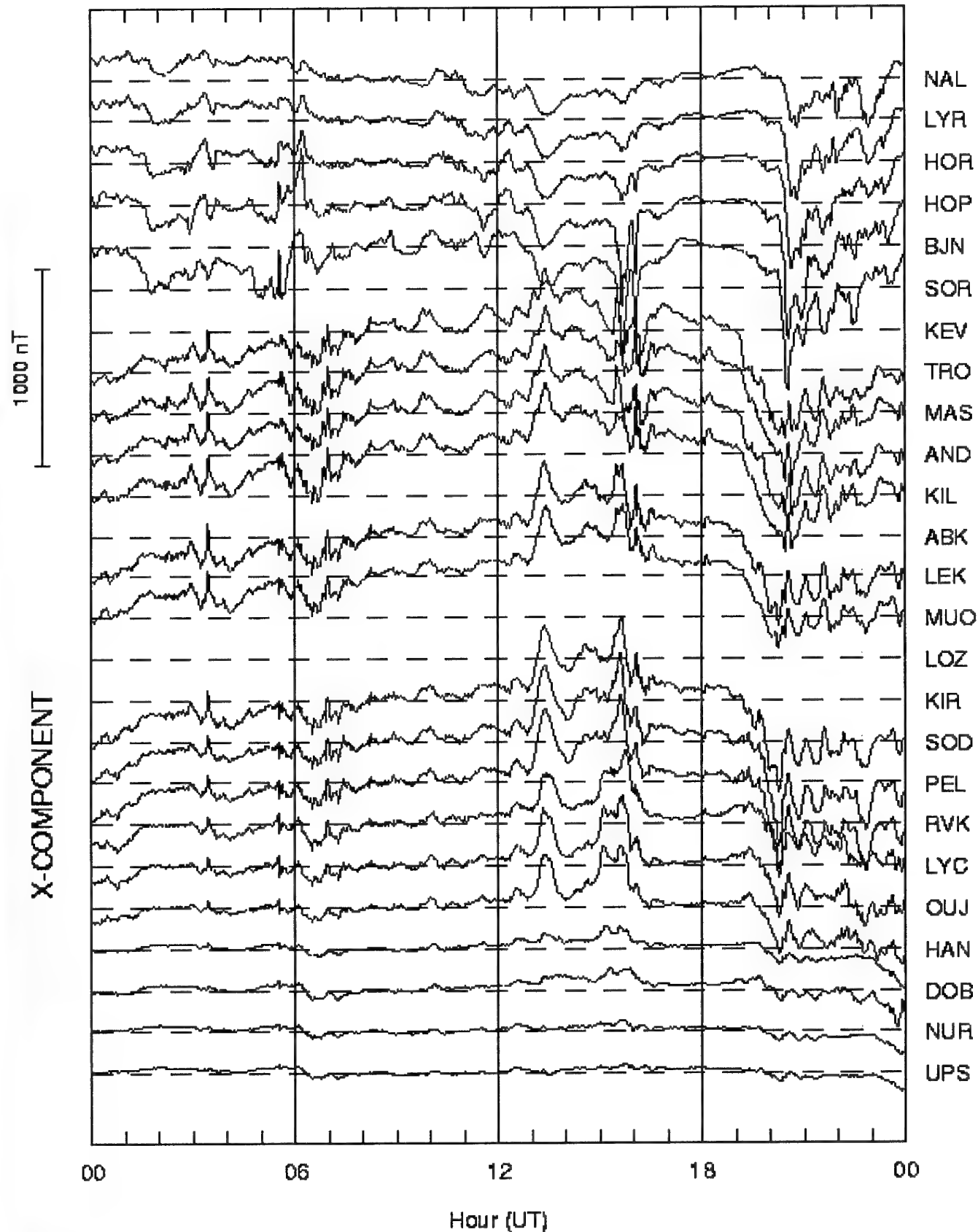


IMAGE magnetometer network 2000-11-28

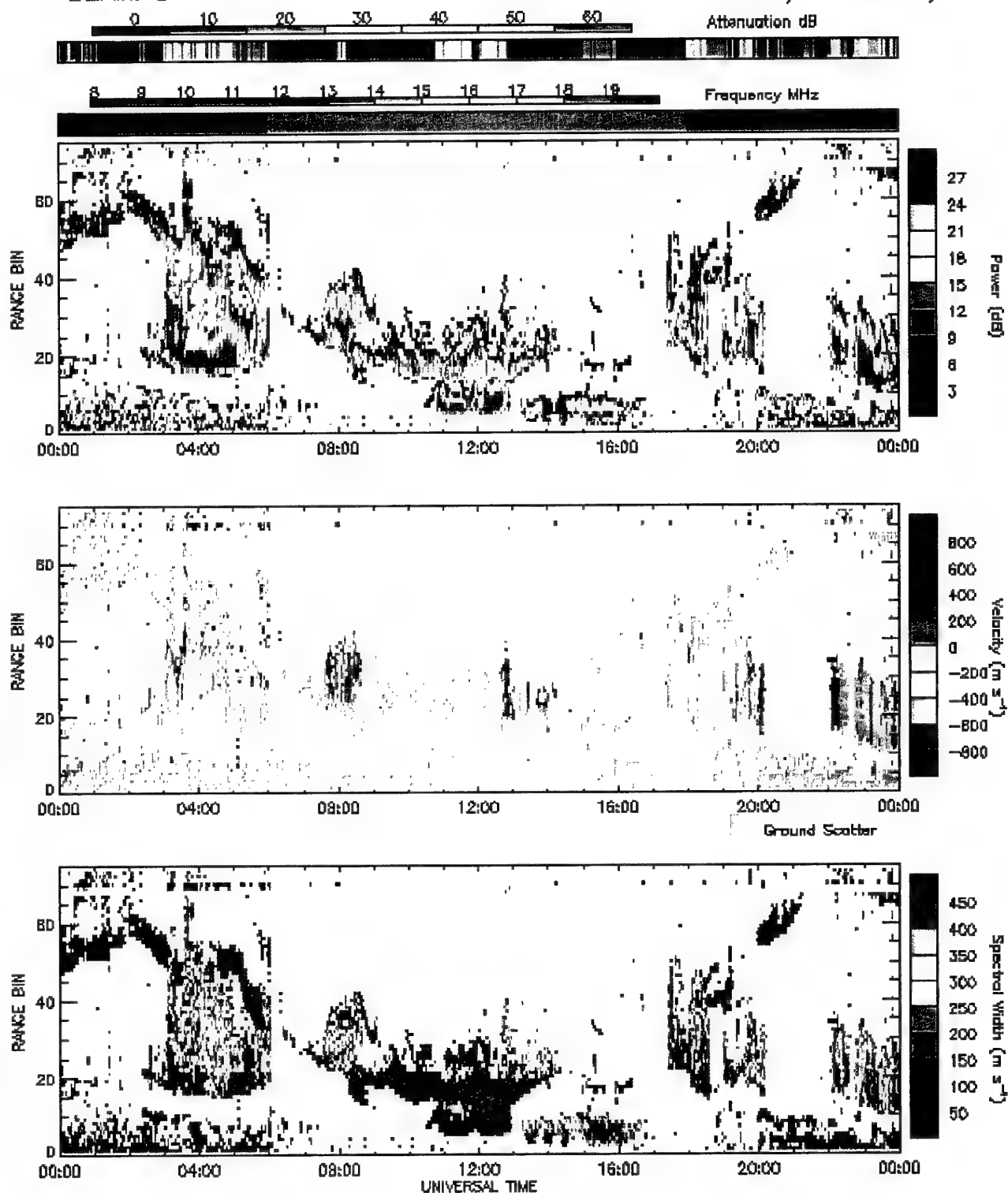
2 minute averages



CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 28/November/2000



Contents, December 01, 2000 :

-IMF-ACE plot

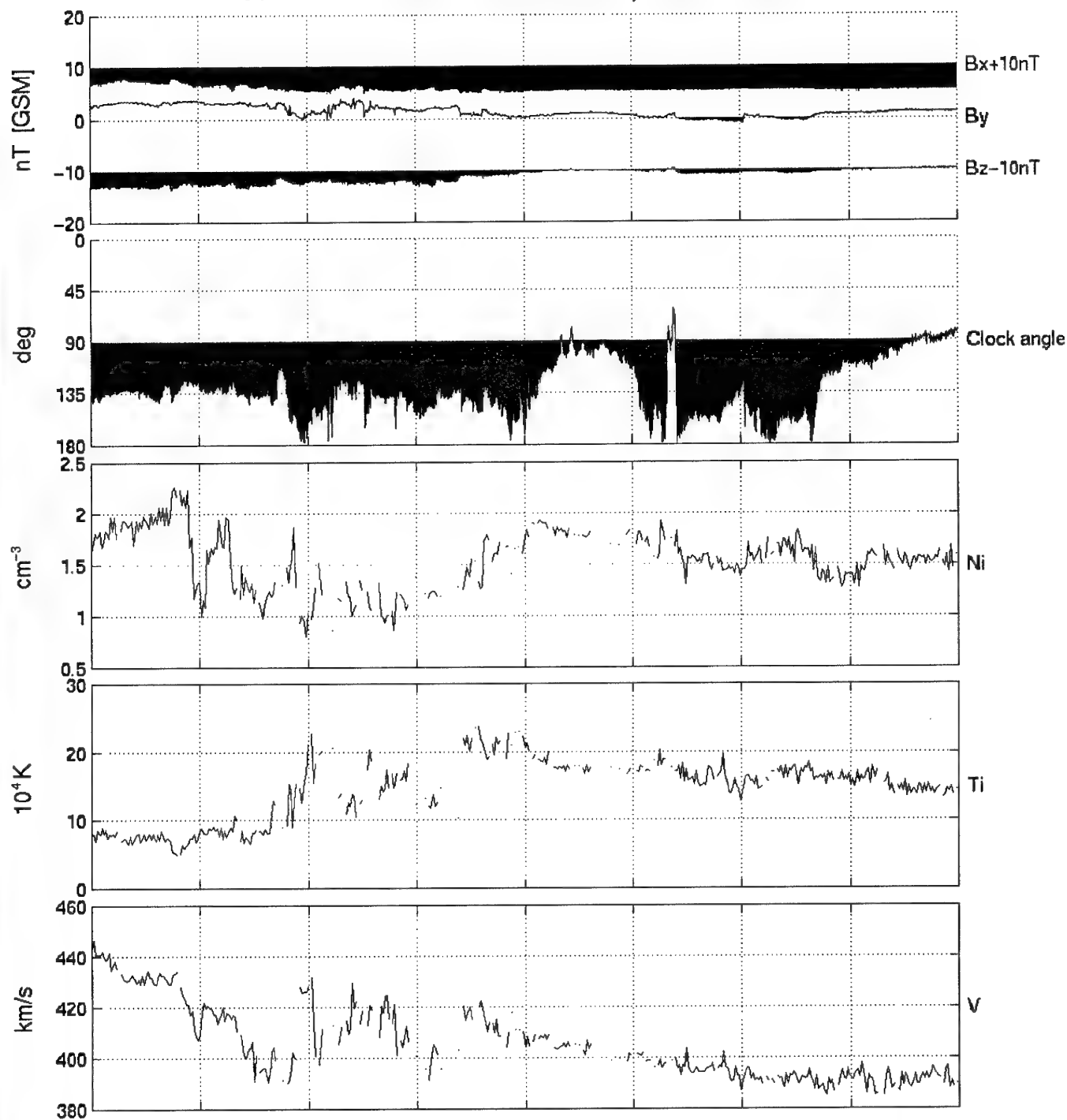
-EISCAT VHF(Tromsø) radar summary plots

-EISCAT Svalbard summary plots

-IMAGE magnetometer data

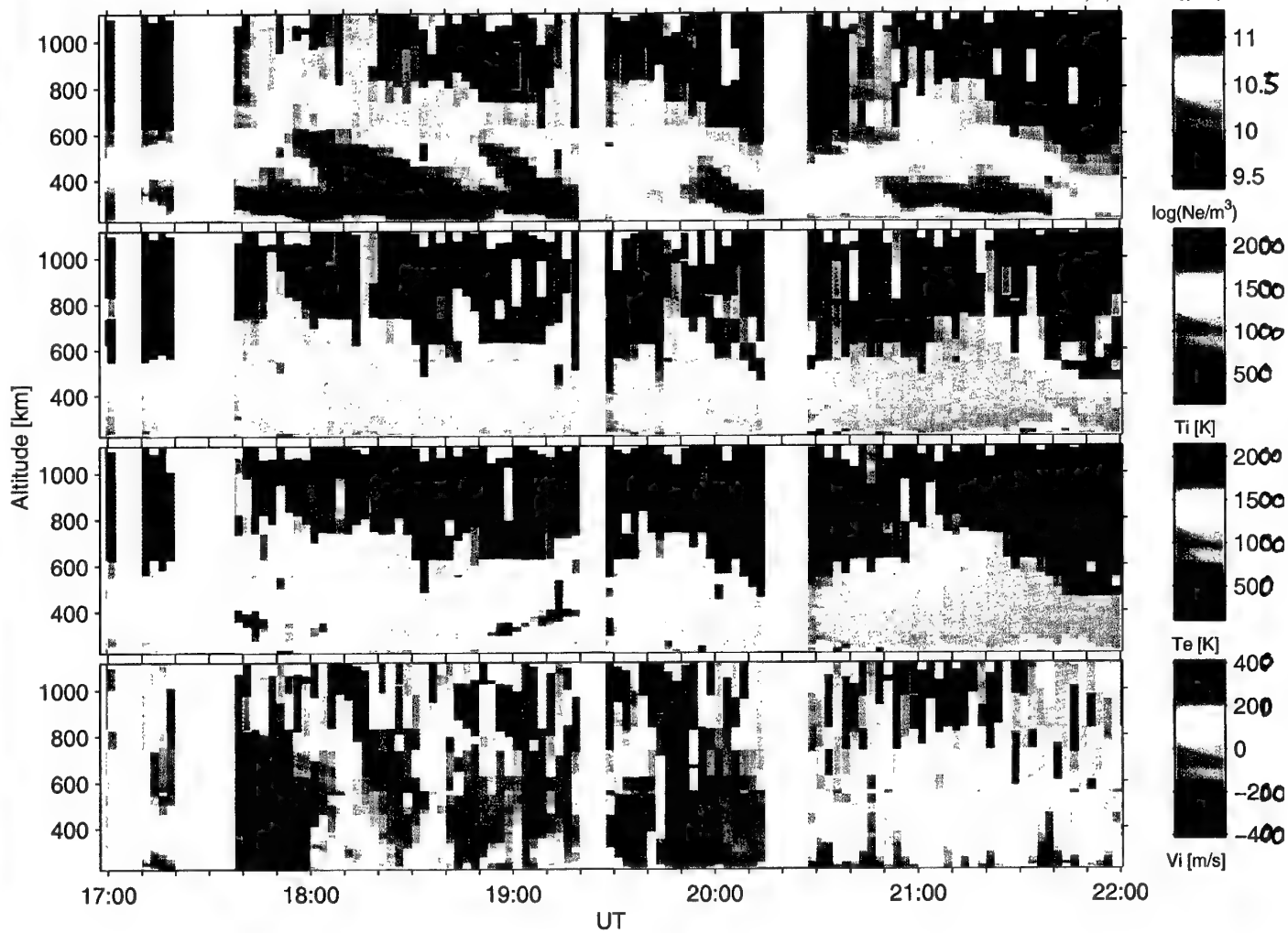
-CUTLASS Finland, Range-Time-Parameter plot

ACE: Solar Wind Parameters, Dec 1 2000

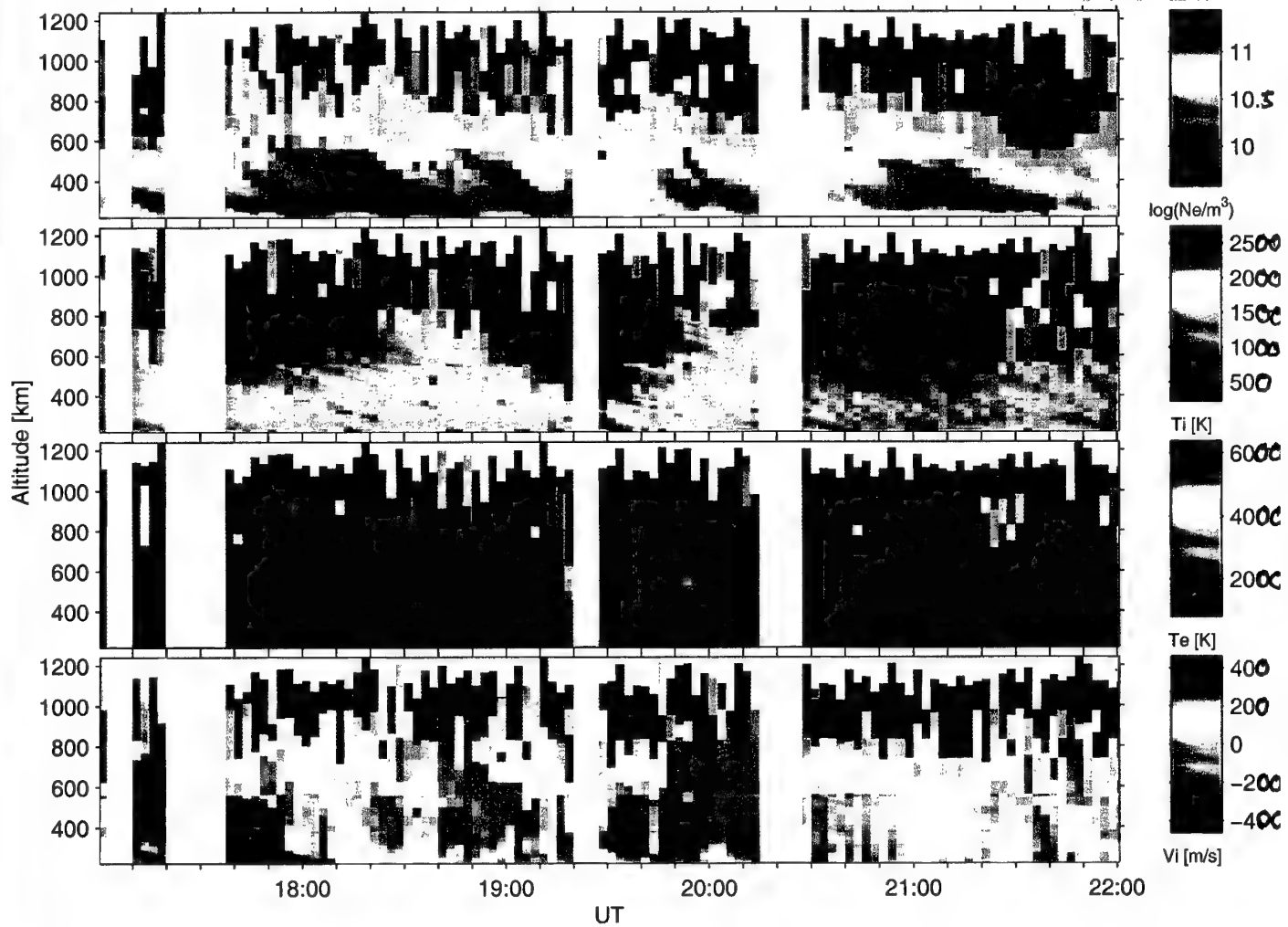


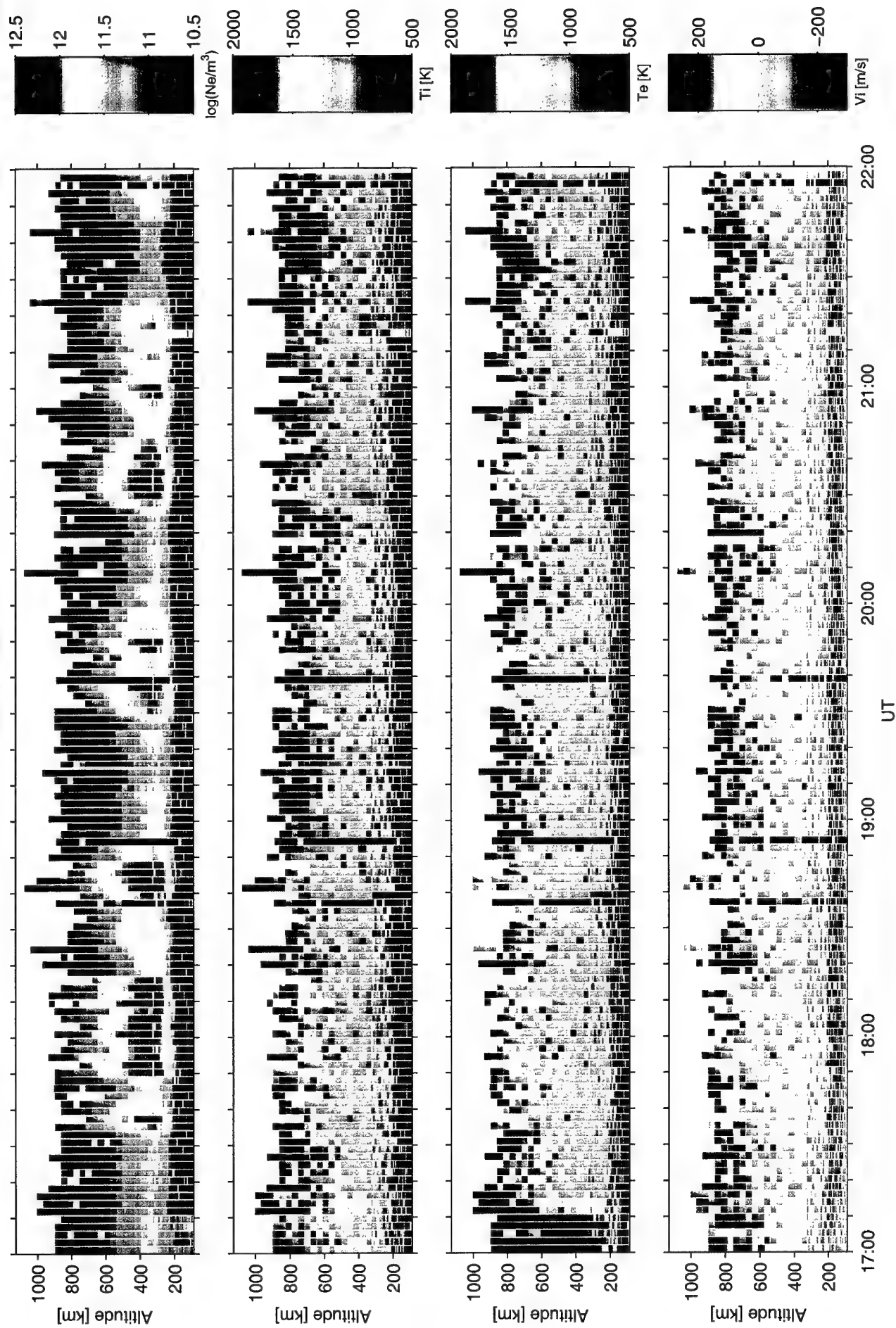
UT	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
X [GSM]	226.6	226.6	226.6	226.6	226.6	226.6	226.6	226.6	226.7
Y [GSM]	36.4	36.4	36.5	36.5	36.6	36.6	36.6	36.6	36.7
Z [GSM]	-18.6	-18.5	-18.4	-18.4	-18.3	-18.3	-18.2	-18.2	-18.1

Tromso VHF 01 Dec 2000-01 Dec 2000 Az -0 El 30



Tromso VHF 01 Dec 2000-01 Dec 2000 Az -15- 0 El 30





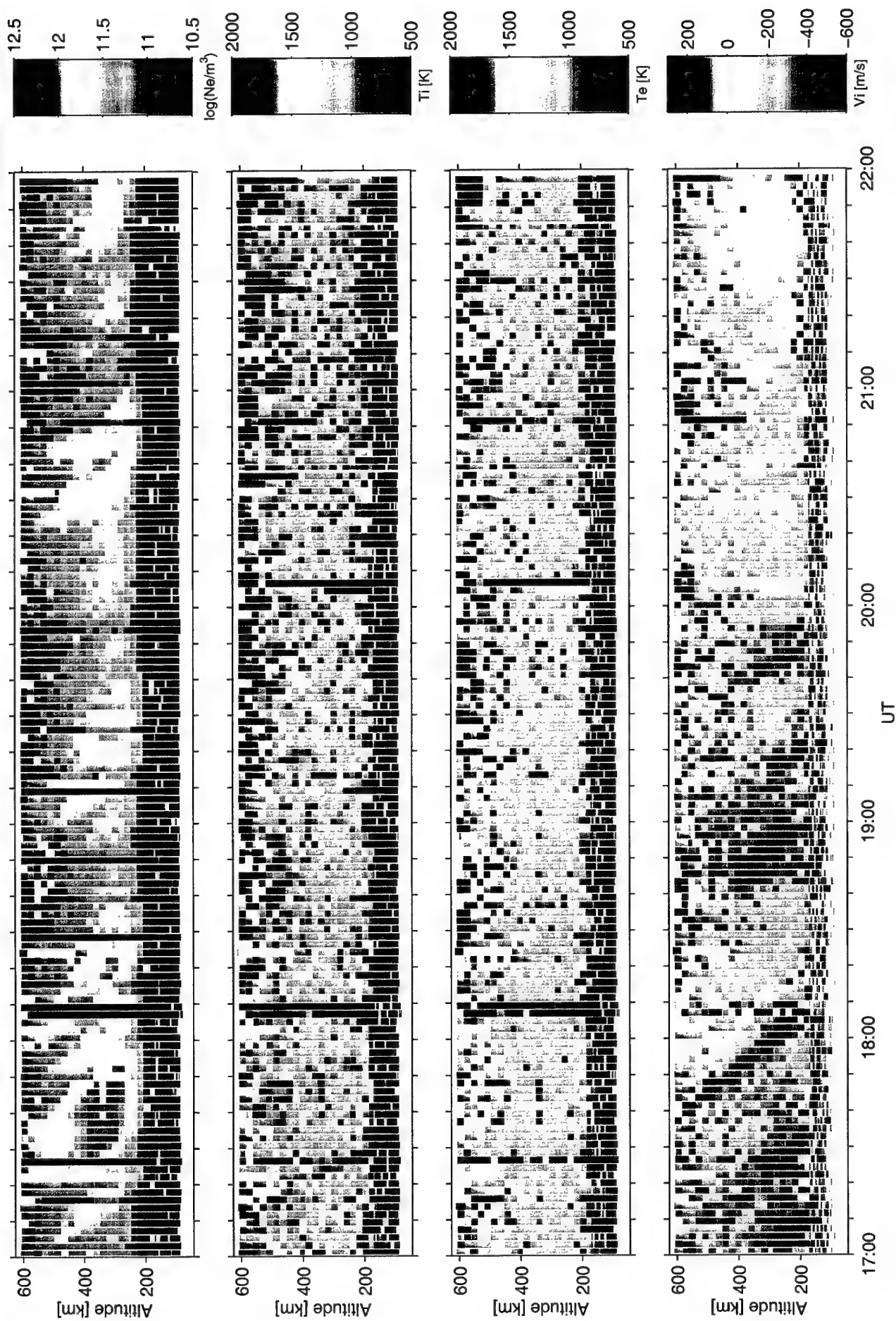
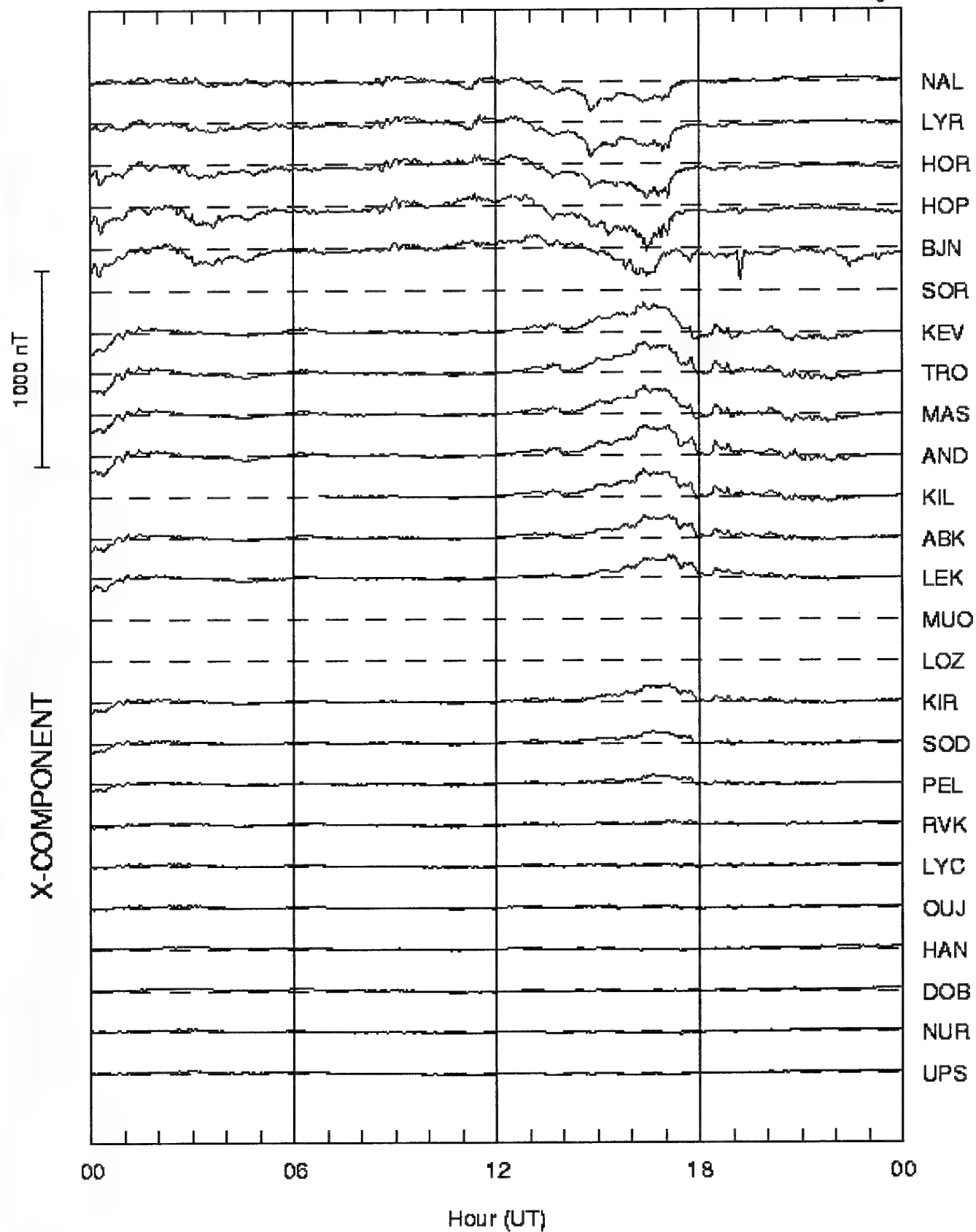


IMAGE magnetometer network 2000-12-01

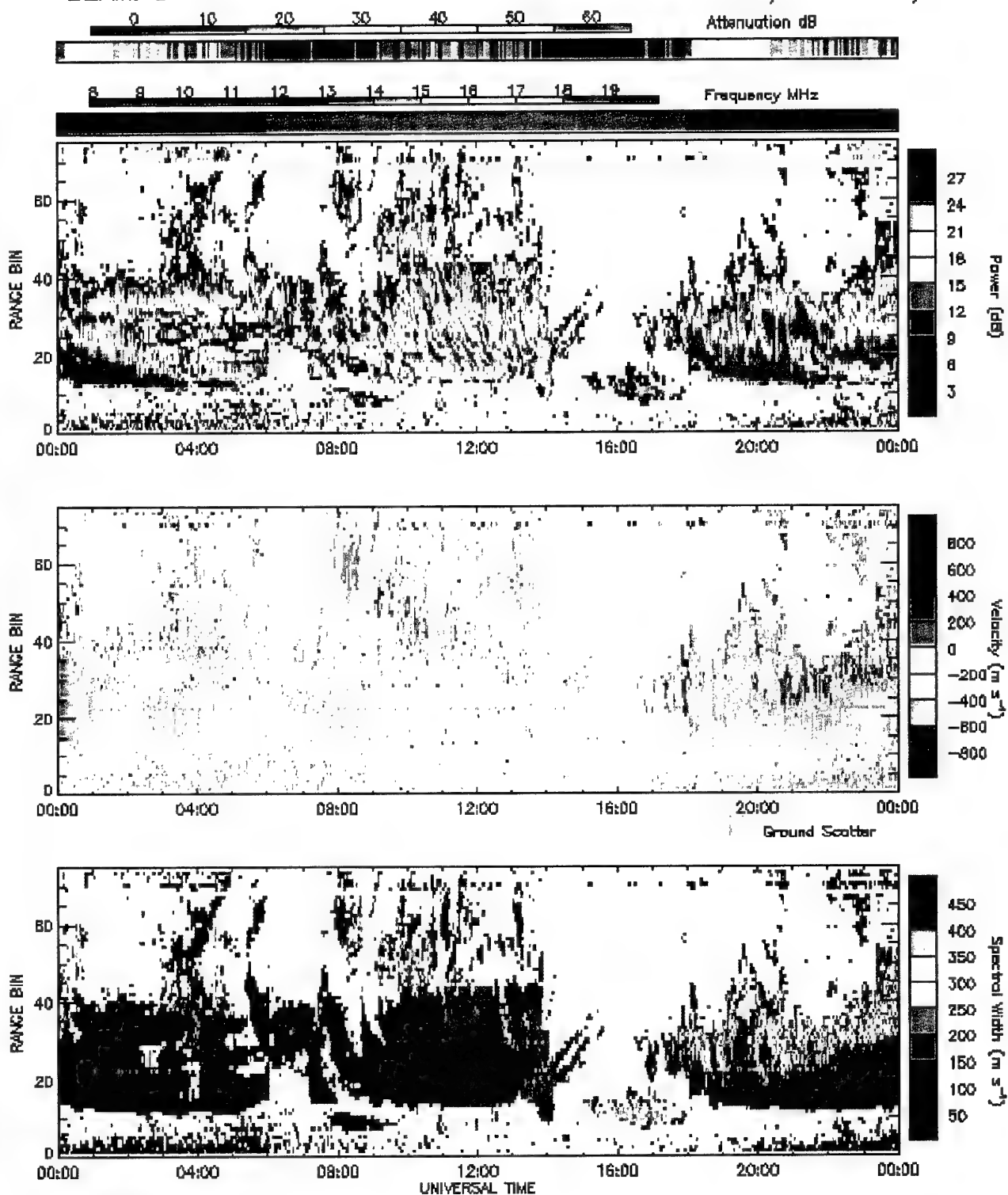
2 minute averages



CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 1/December/2000



Contents, December 04, 2000 :

-IMF-ACE plot

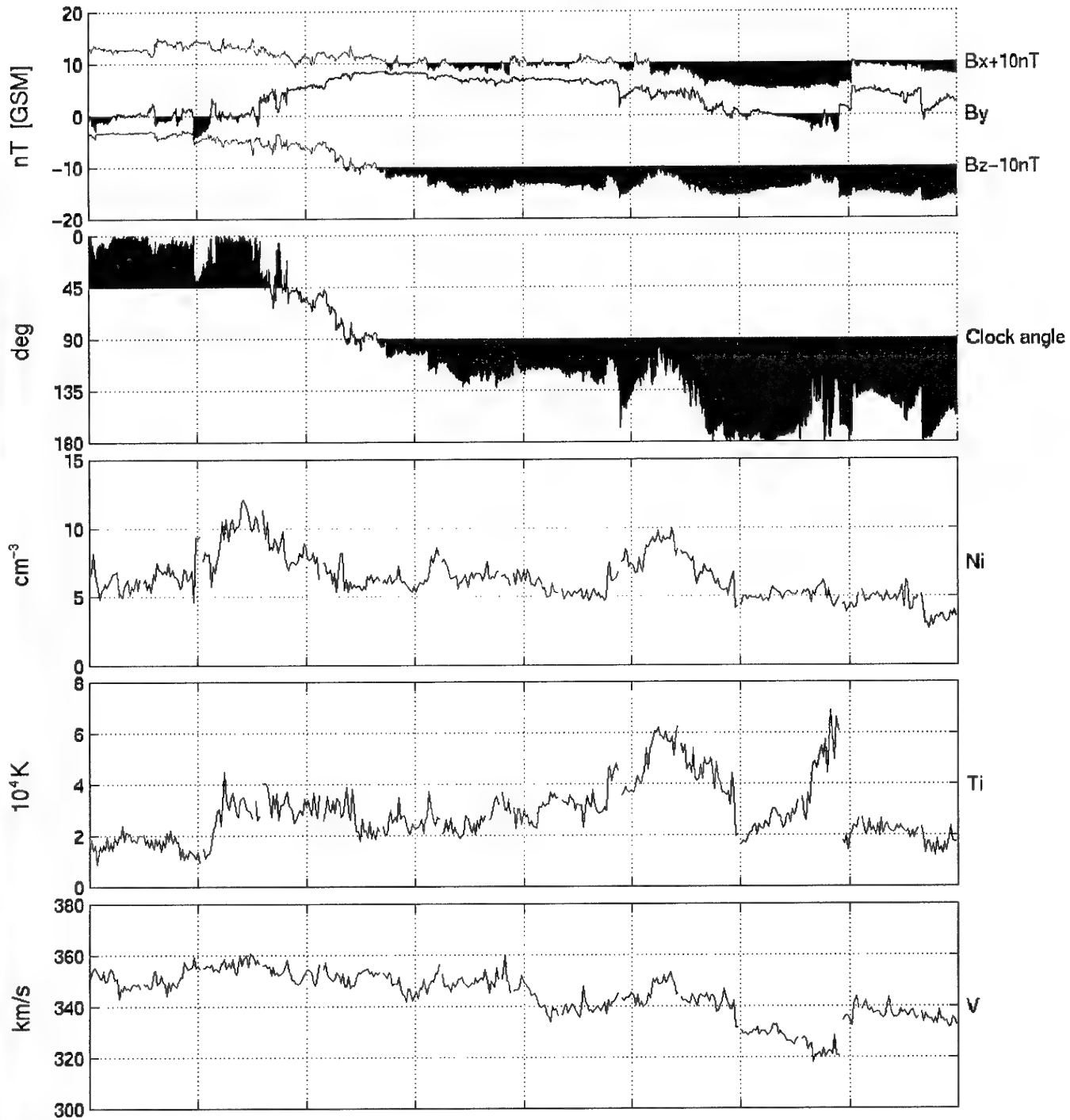
-EISCAT Svalbard summary plots

-IMAGE magnetometer data

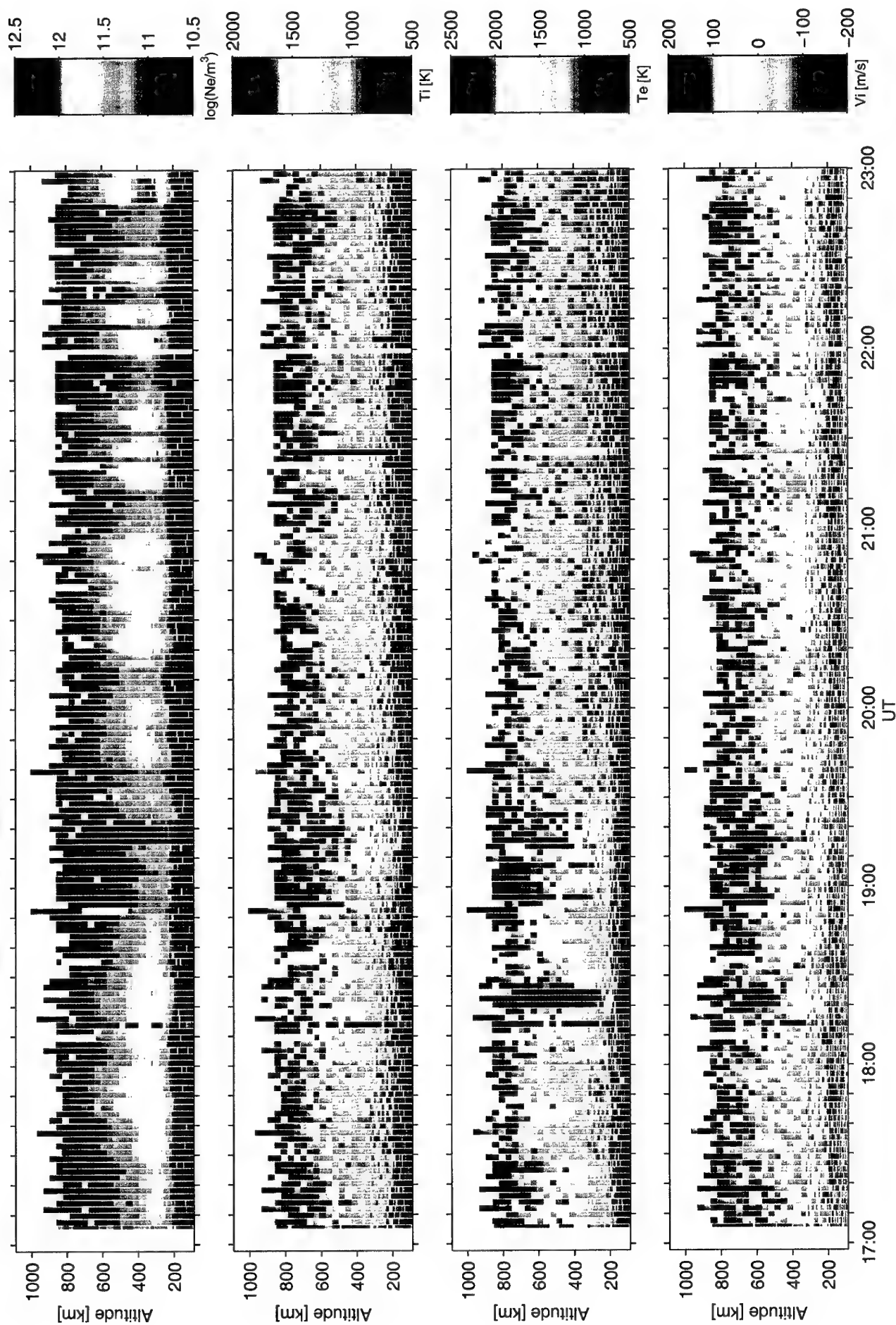
-CUTLASS Finland, Range-Time-Parameter plot

Note: EISCAT VHF(Tromsø) radar data for this date was not available at the time of this printing.

ACE: Solar Wind Parameters, Dec 4 2000



UT	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
X	227.3	227.4	227.4	227.4	227.4	227.4	227.4	227.4	227.4
Y _{GSM}	36.3	36.4	36.5	36.7	36.8	36.9	37.0	37.1	37.2
Z _{GSM}	-19.2	-18.9	-18.7	-18.4	-18.1	-17.8	-17.6	-17.3	-17.0



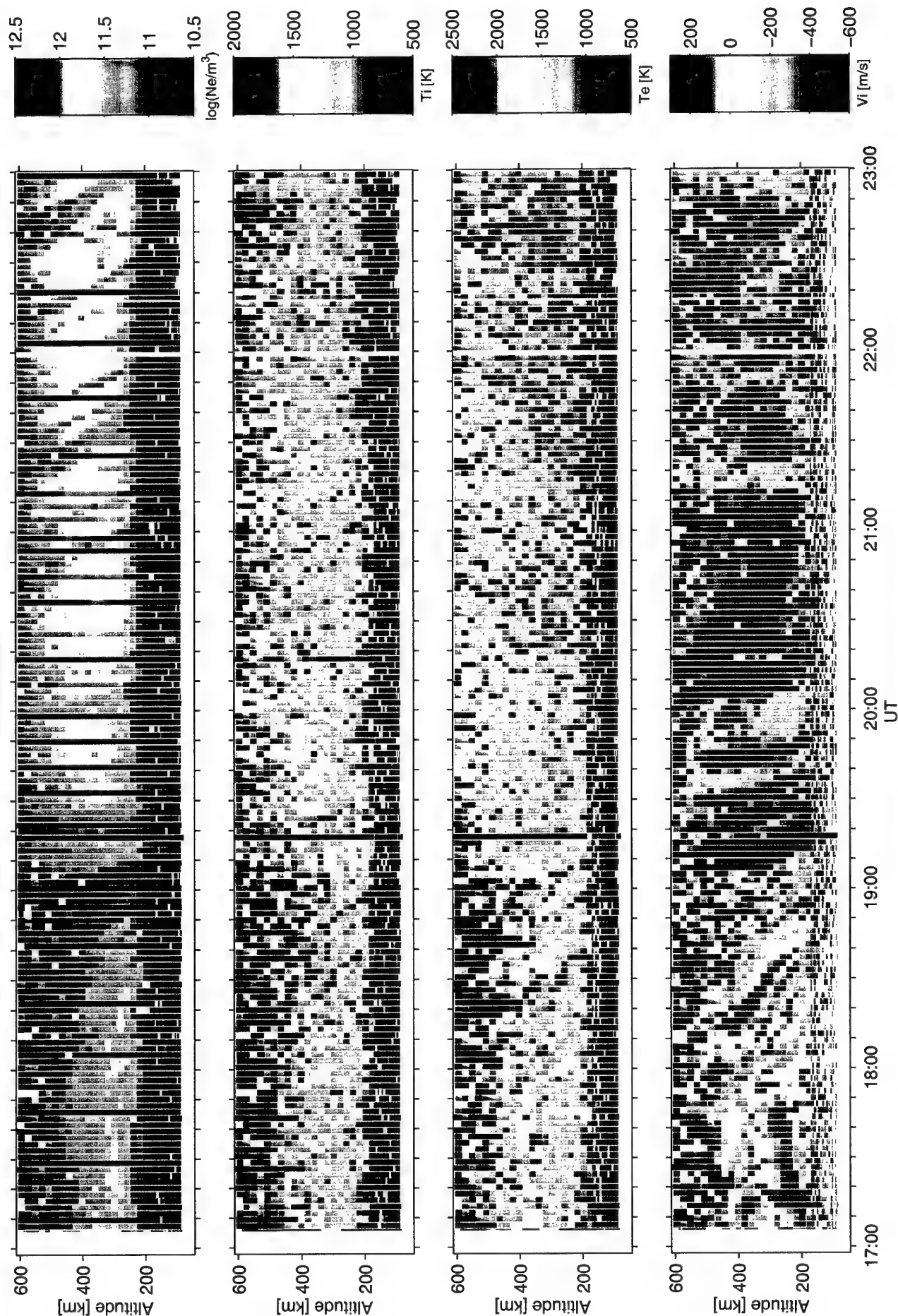
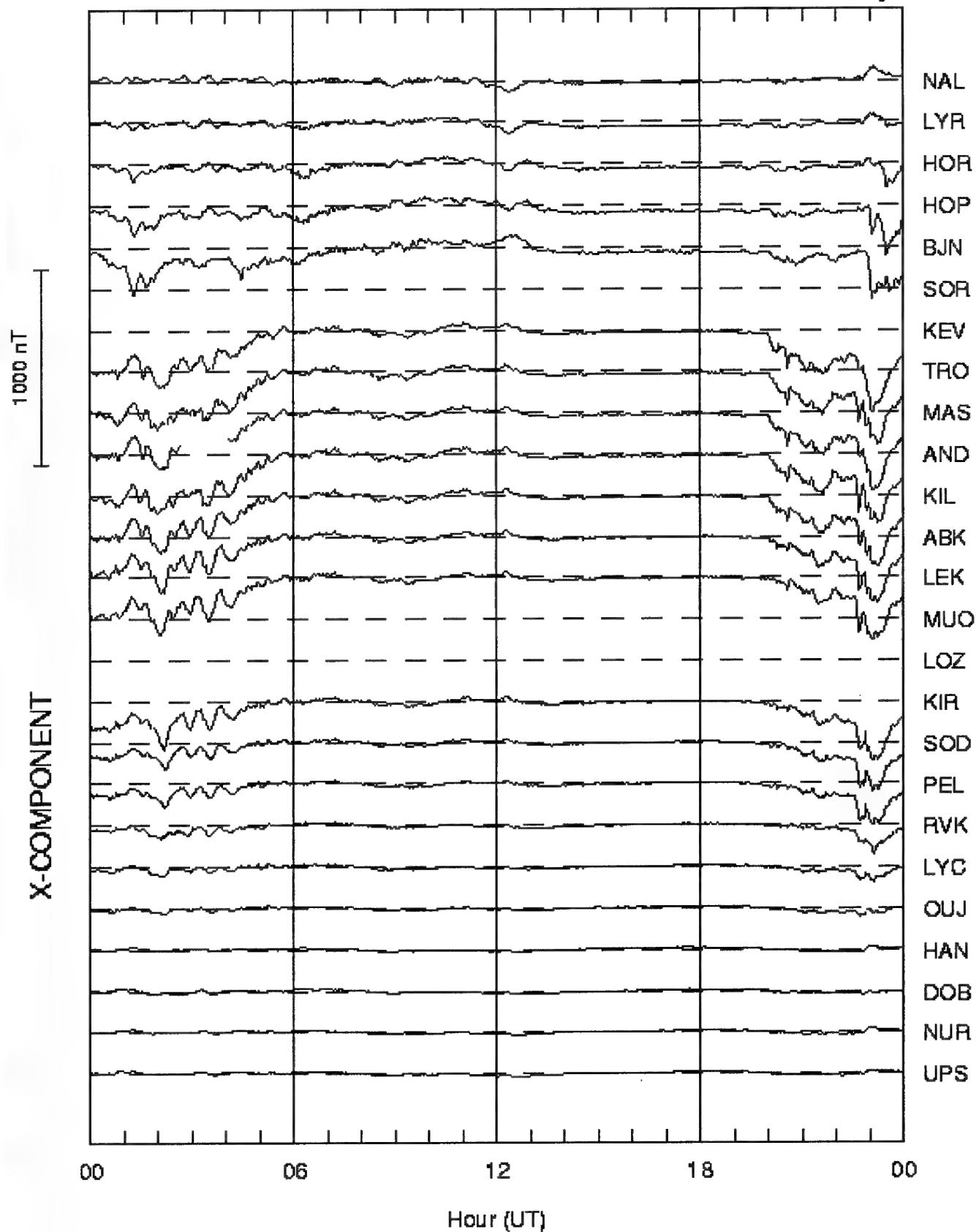


IMAGE magnetometer network 2000-12-04

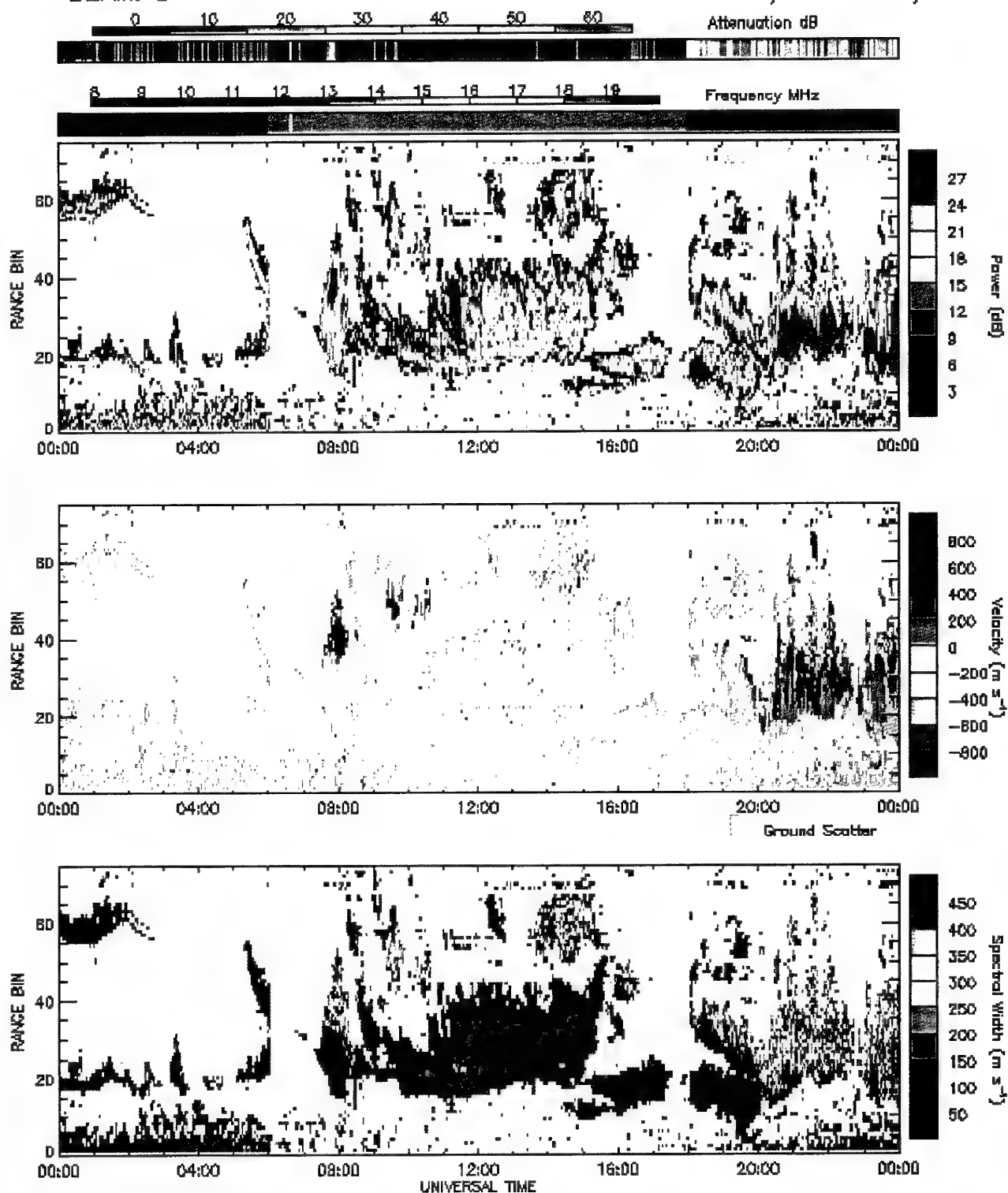
2 minute averages



CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 4/December/2000



Contents, December 07, 2000 :

-IMF-ACE plot

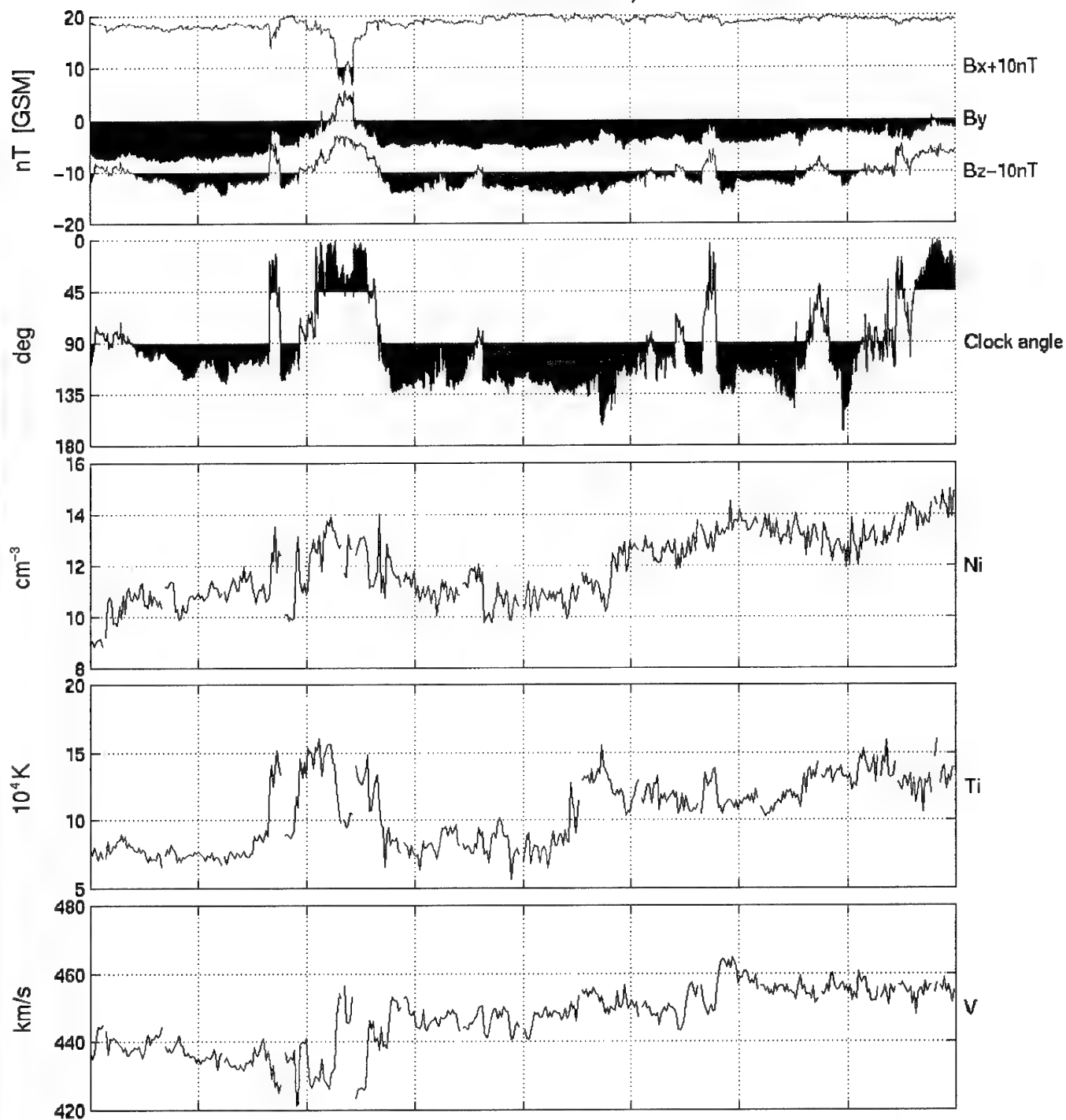
-EISCAT Svalbard summary plots

-IMAGE magnetometer data

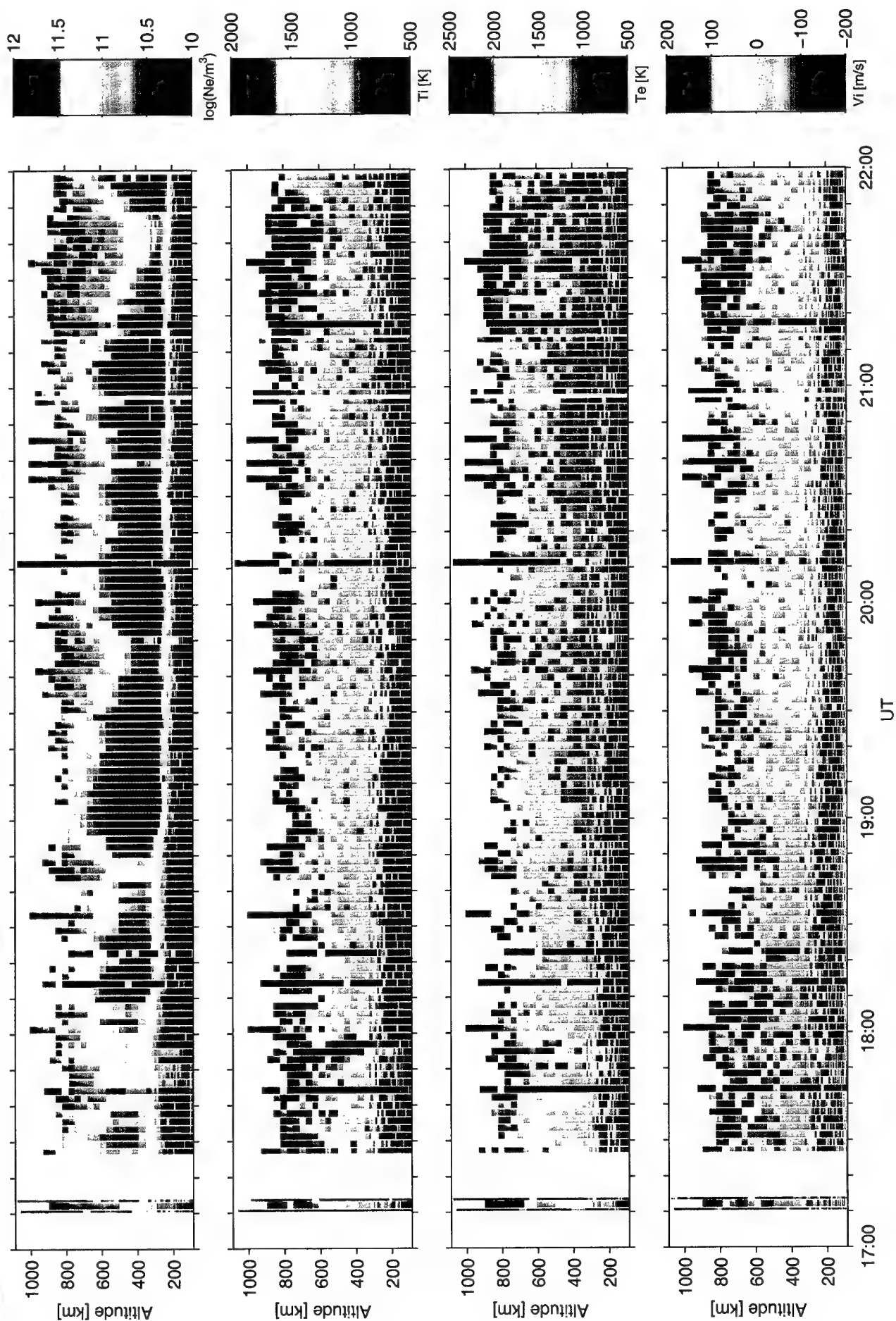
-CUTLASS Finland, Range-Time-Parameter plot

Note: EISCAT VHF(Tromsø) radar data for this date was not available at the time of this printing.

ACE: Solar Wind Parameters, Dec 7 2000



UT	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
X [GSM]	228.2	228.2	228.2	228.3	228.3	228.3	228.3	228.3	228.3
Y [GSM]	38.4	38.3	38.4	38.4	38.4	38.4	38.4	38.5	38.5
Z [GSM]	-13.6	-13.7	-13.6	-13.5	-13.4	-13.3	-13.2	-13.1	-13.0



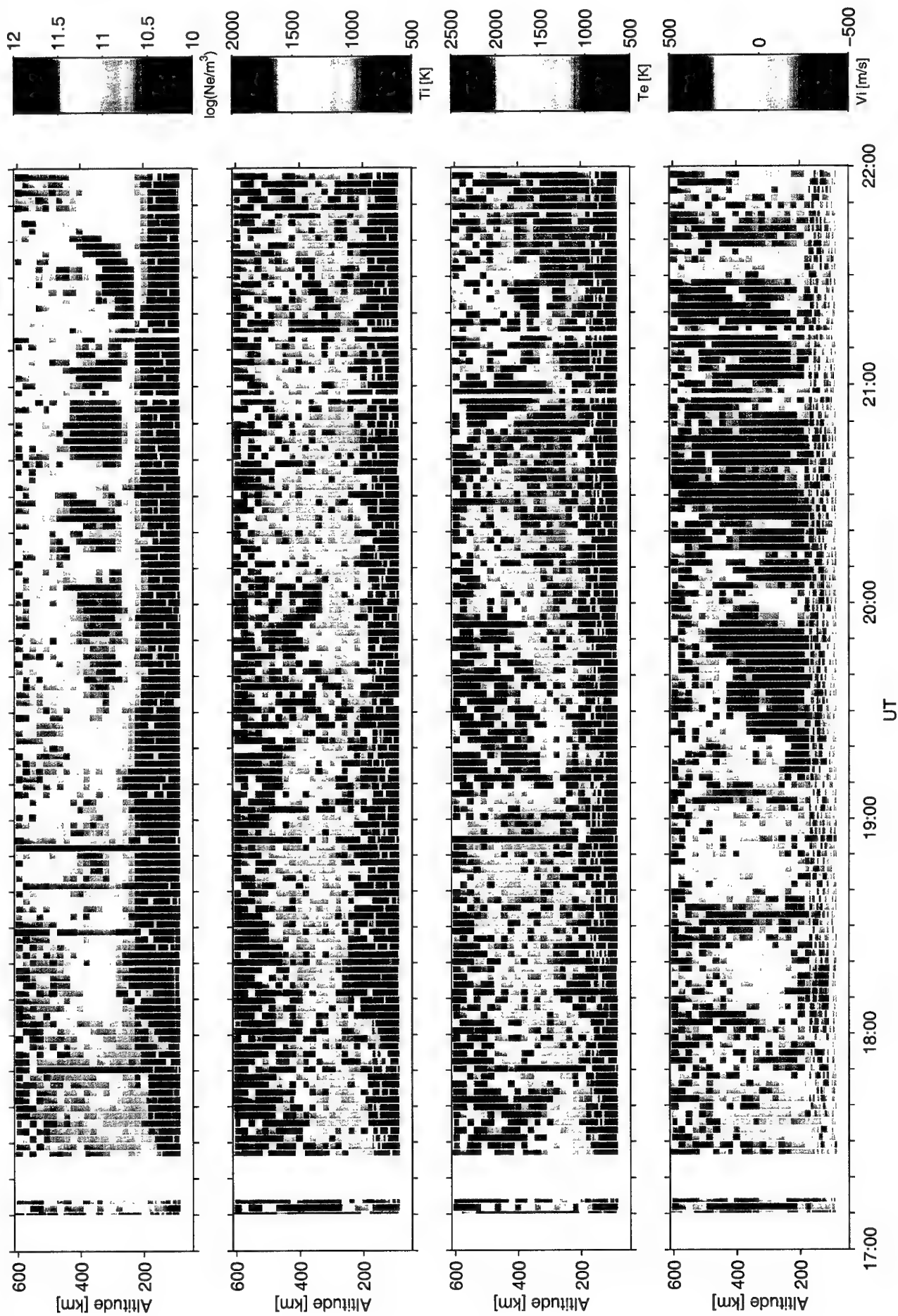
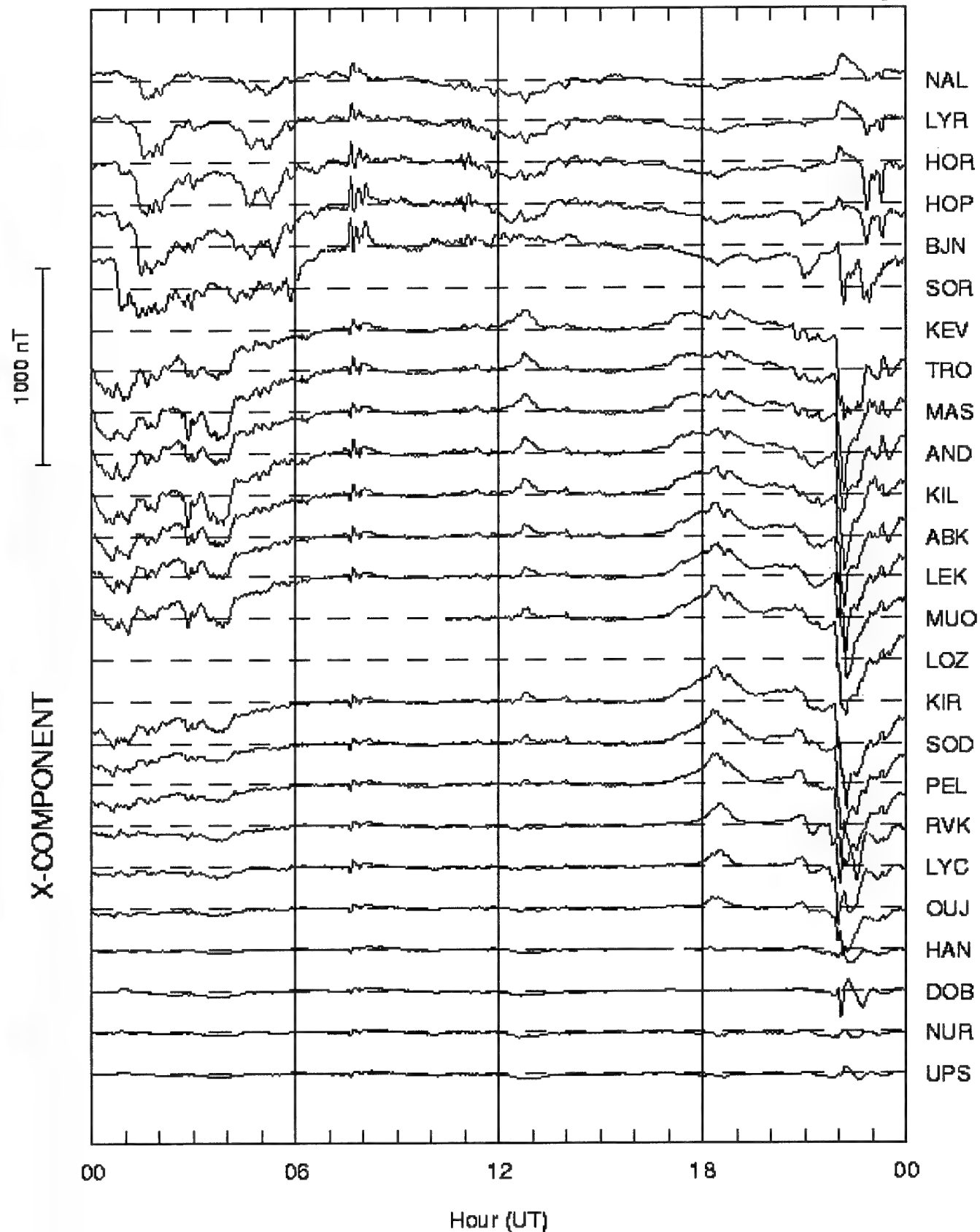


IMAGE magnetometer network 2000-12-07

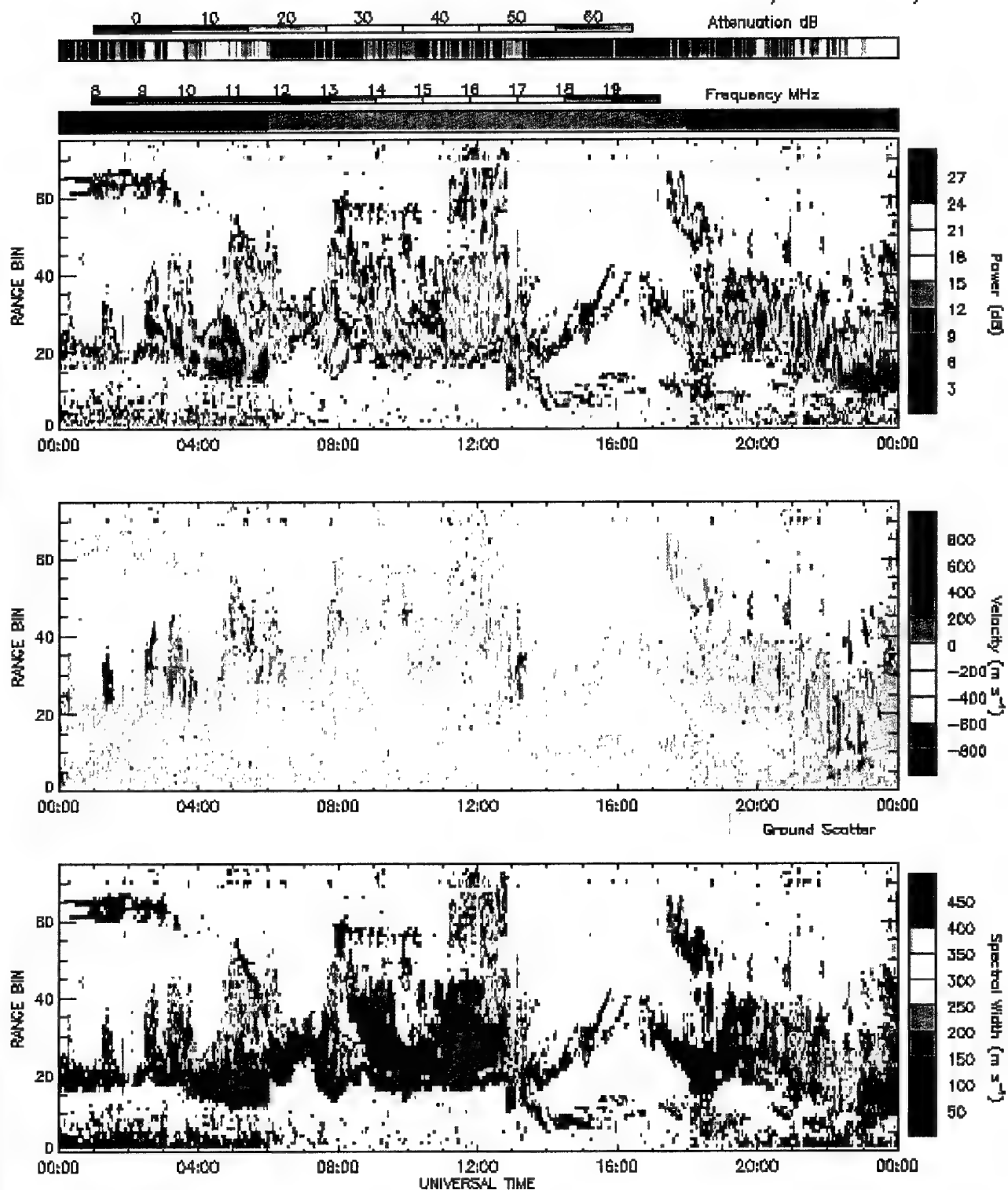
2 minute averages



CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 7/December/2000



Contents, January 15, 2000 :

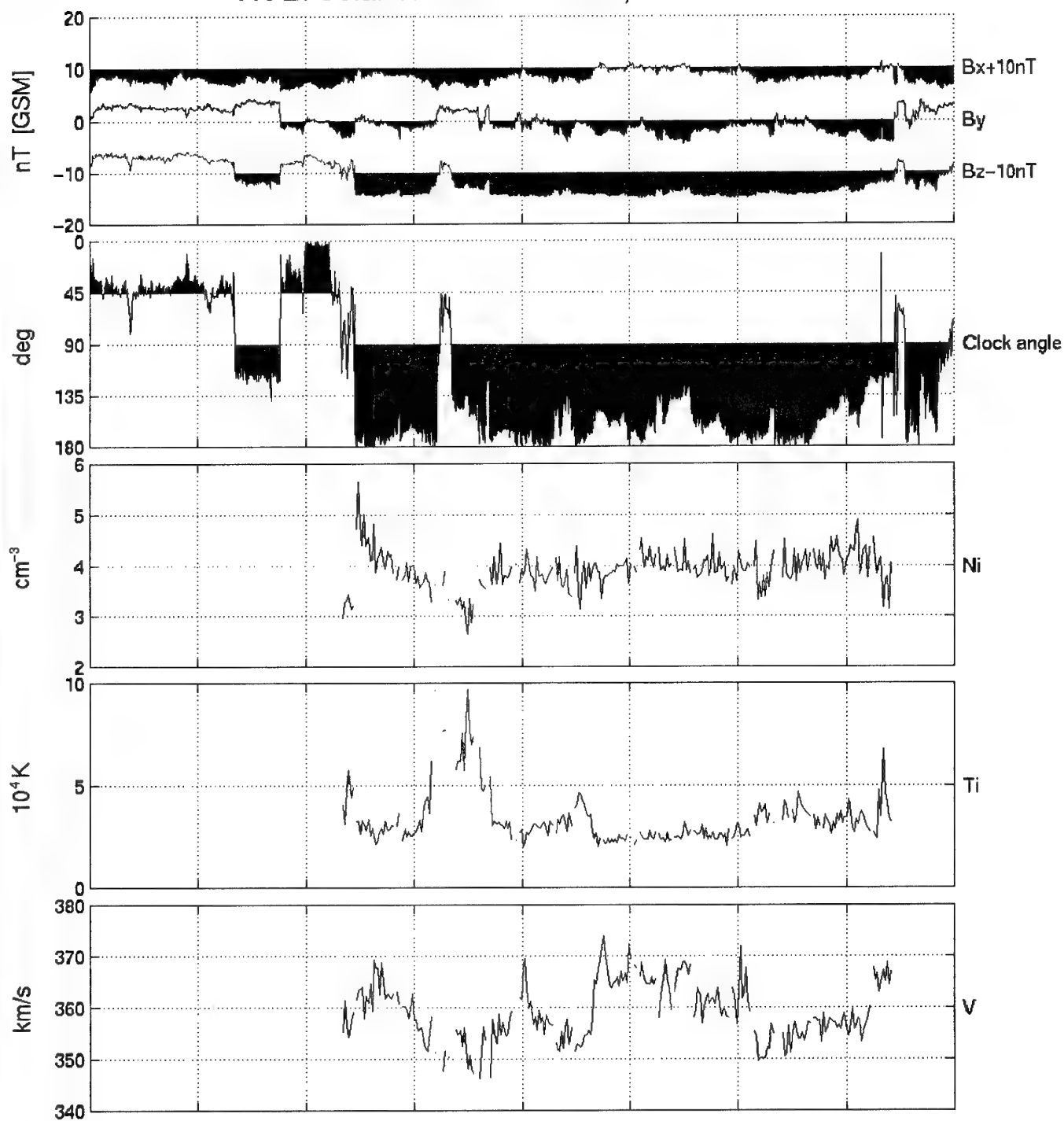
-IMF-ACE plot

-EISCAT Svalbard summary plots(64 sec. resolution)

-IMAGE magnetometer data

-CUTLASS Finland, Range-Time-Parameter plot

ACE: Solar Wind Parameters, Jan 15 2001



UT	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00
X [GSM]	241.6	241.6	241.6	241.6	241.7	241.7	241.7	241.7	241.7
Y [GSM]	5.2	5.3	5.4	5.5	5.7	5.8	5.9	6.0	6.2
Z [GSM]	20.3	20.2	20.2	20.2	20.1	20.1	20.1	20.0	20.0



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EISCAT SVALBARD RADAR

PCBDYN, 32m, tau0, January 15, 2001

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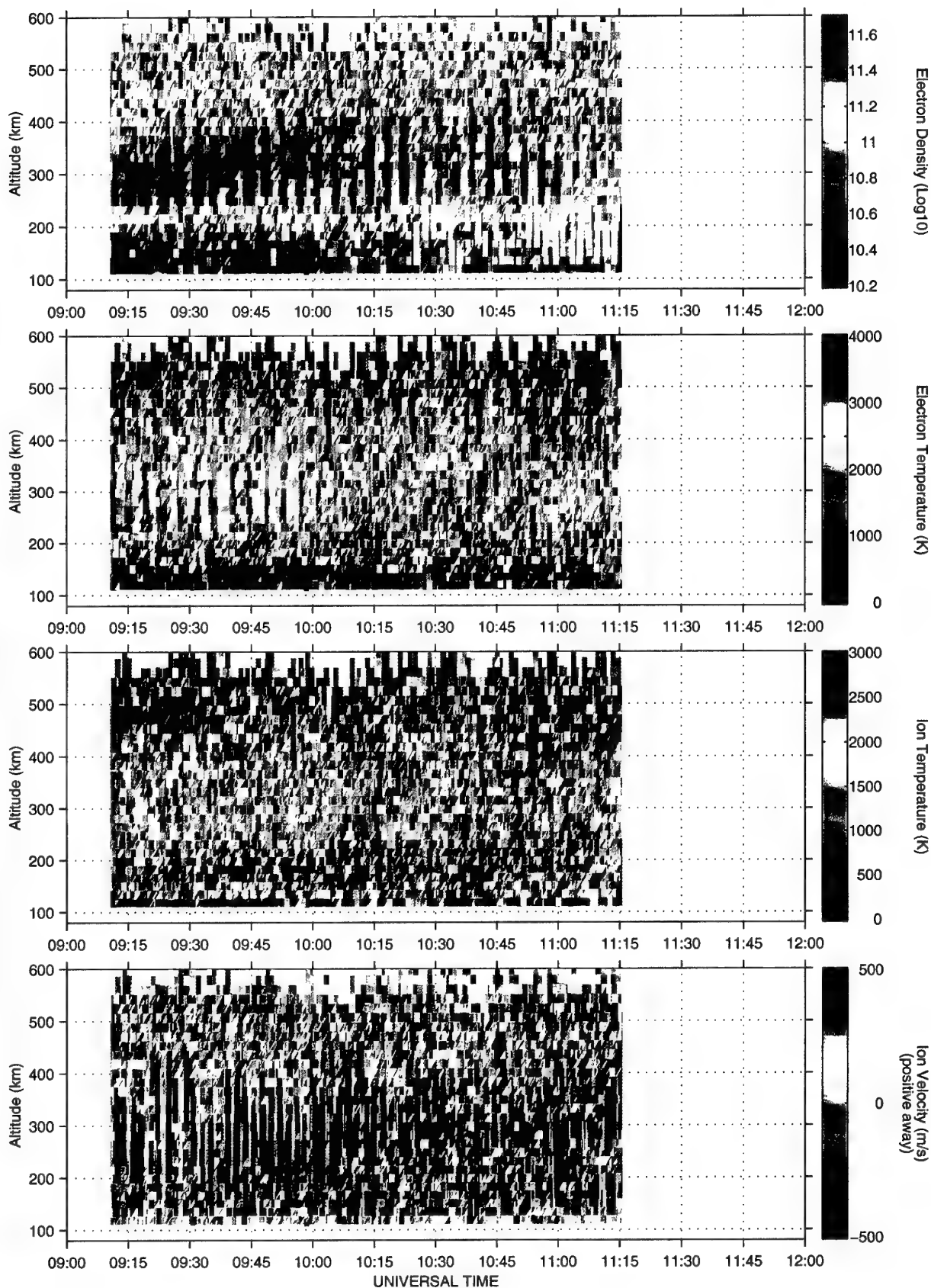
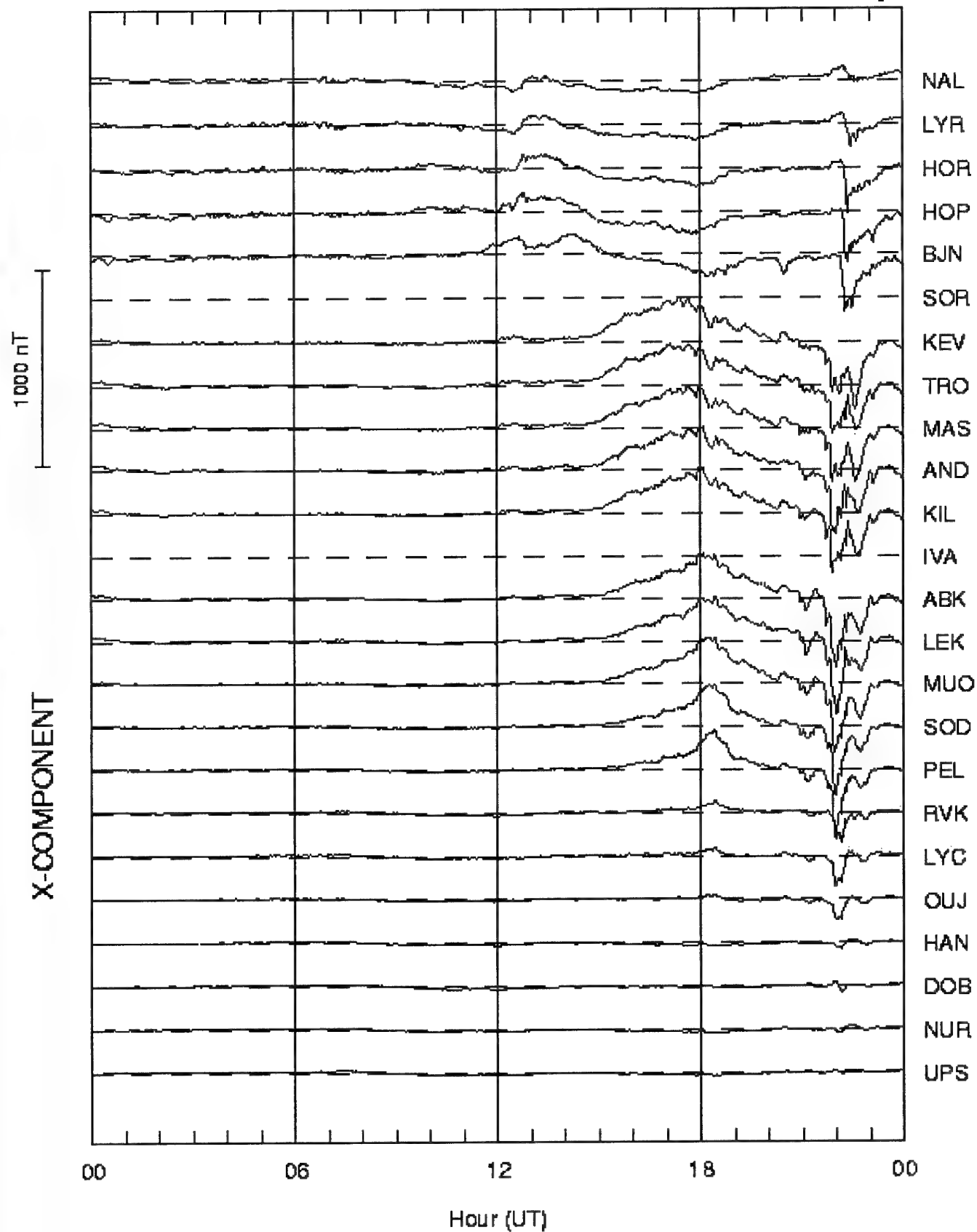


IMAGE magnetometer network 2001-01-15

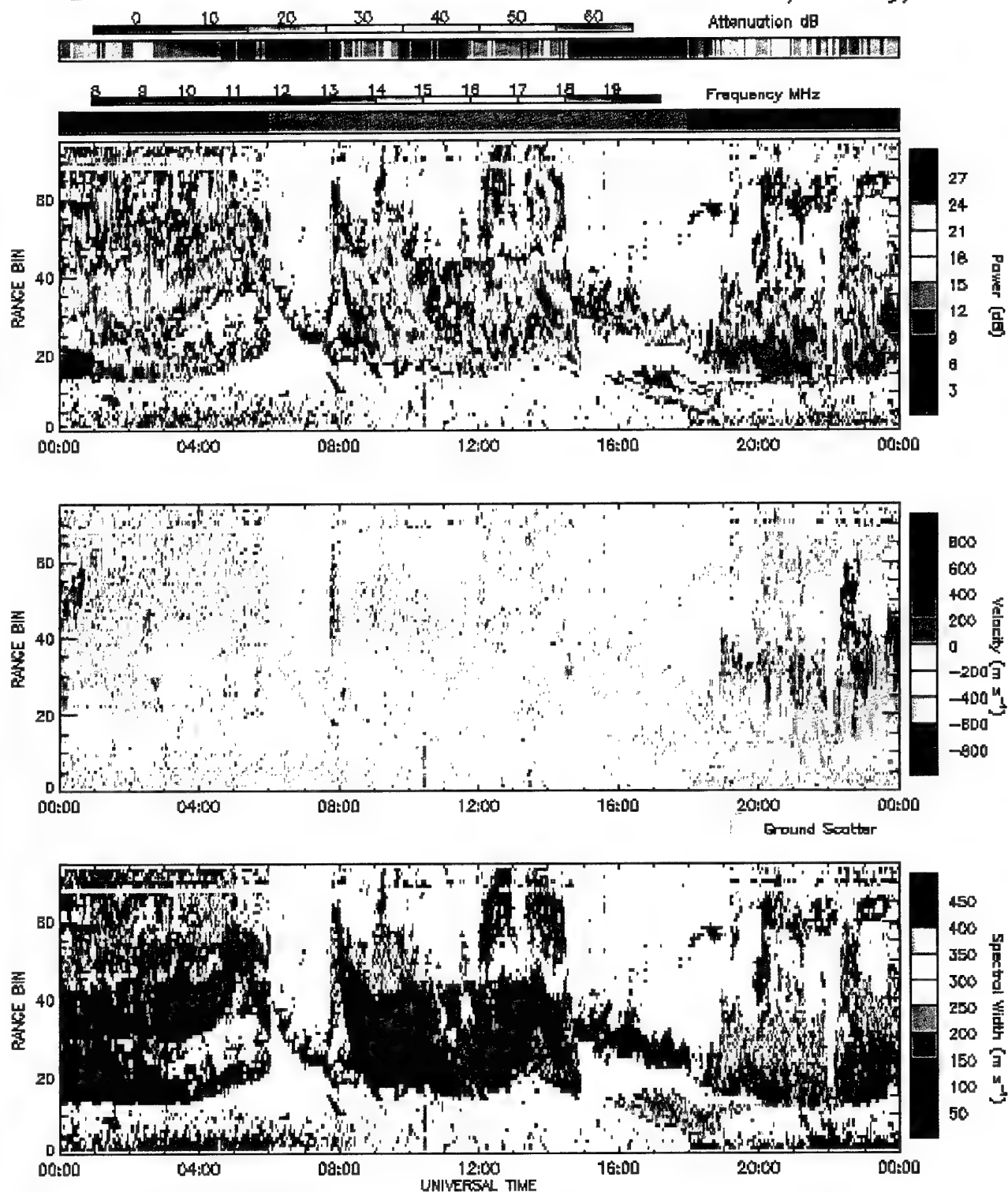
2 minute averages



CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 15/January/2001



Contents, January 16, 2000 :

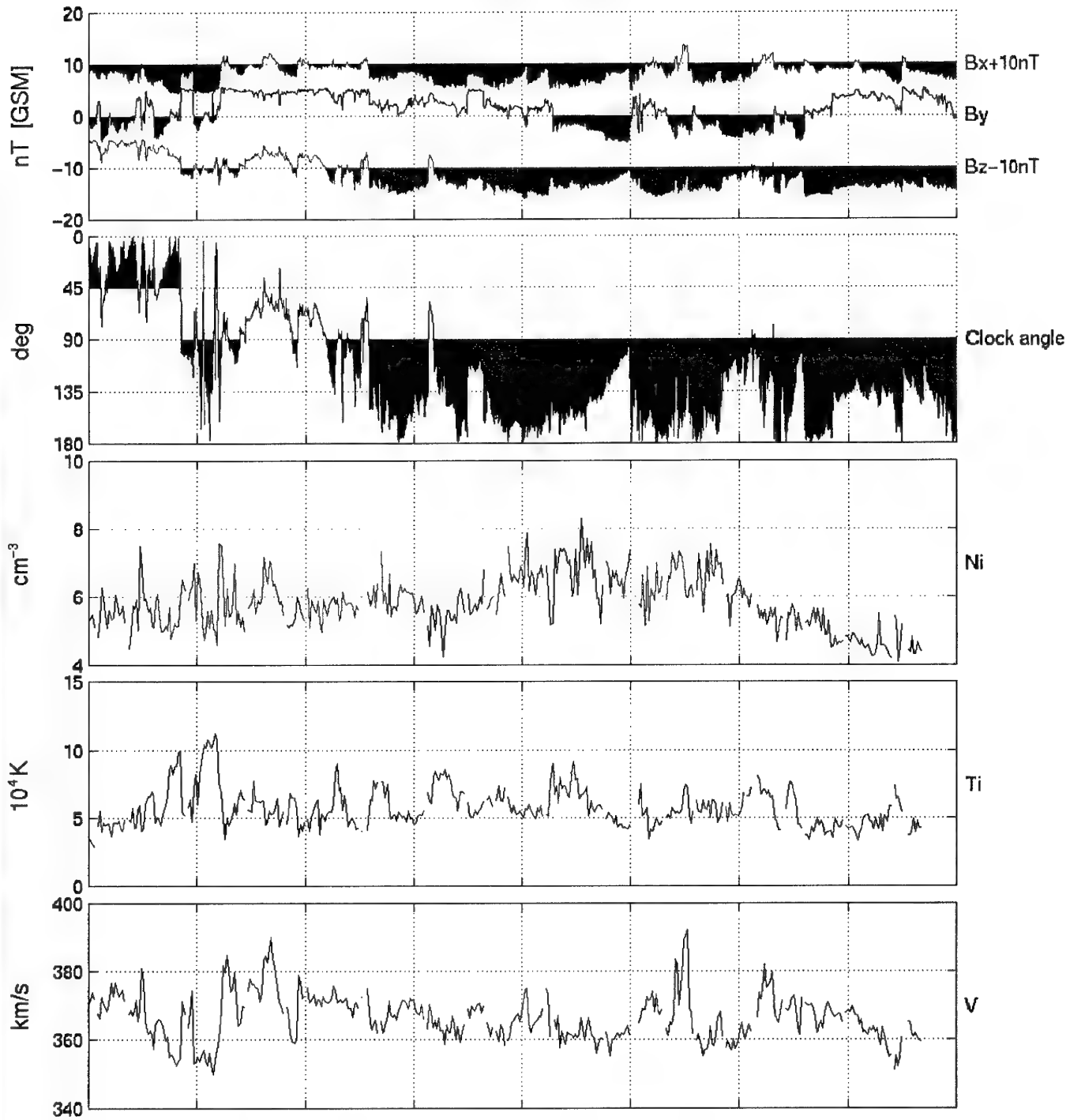
-IMF-ACE plot

-EISCAT Svalbard summary plots(64 sec. resolution)

-IMAGE magnetometer data

-CUTLASS Finland, Range-Time-Parameter plot

ACE: Solar Wind Parameters, Jan 16 2001



UT	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00
X [GSM]	241.9	241.9	241.9	241.9	241.9	241.9	241.9	241.9	241.9
Y [GSM]	3.1	2.9	2.6	2.4	2.2	2.0	1.8	1.6	1.4
Z [GSM]	20.5	20.6	20.6	20.6	20.7	20.7	20.7	20.8	20.8



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EISCAT SVALBARD RADAR

PCBDYN, 32m, tau0, January 16, 2001

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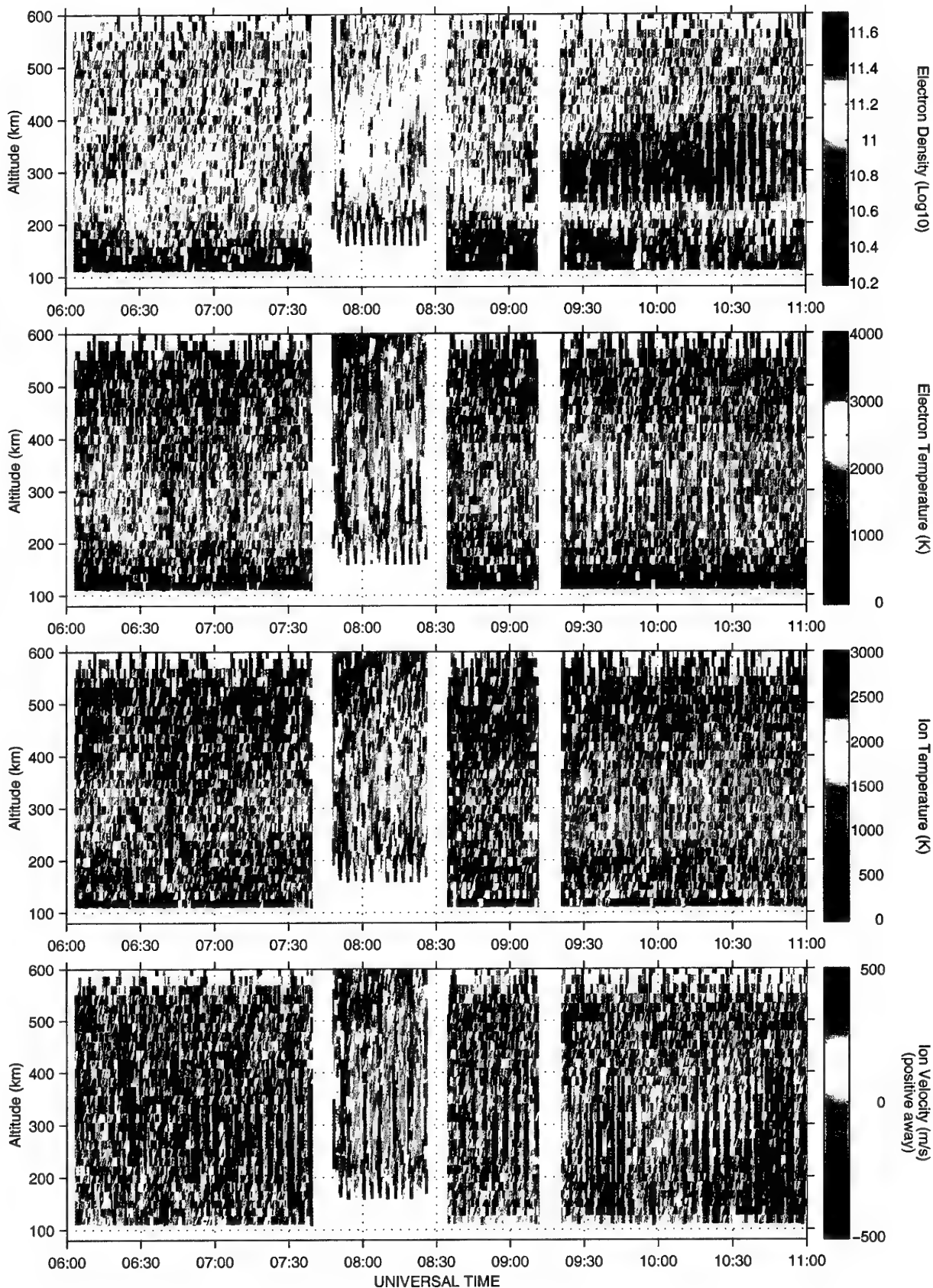
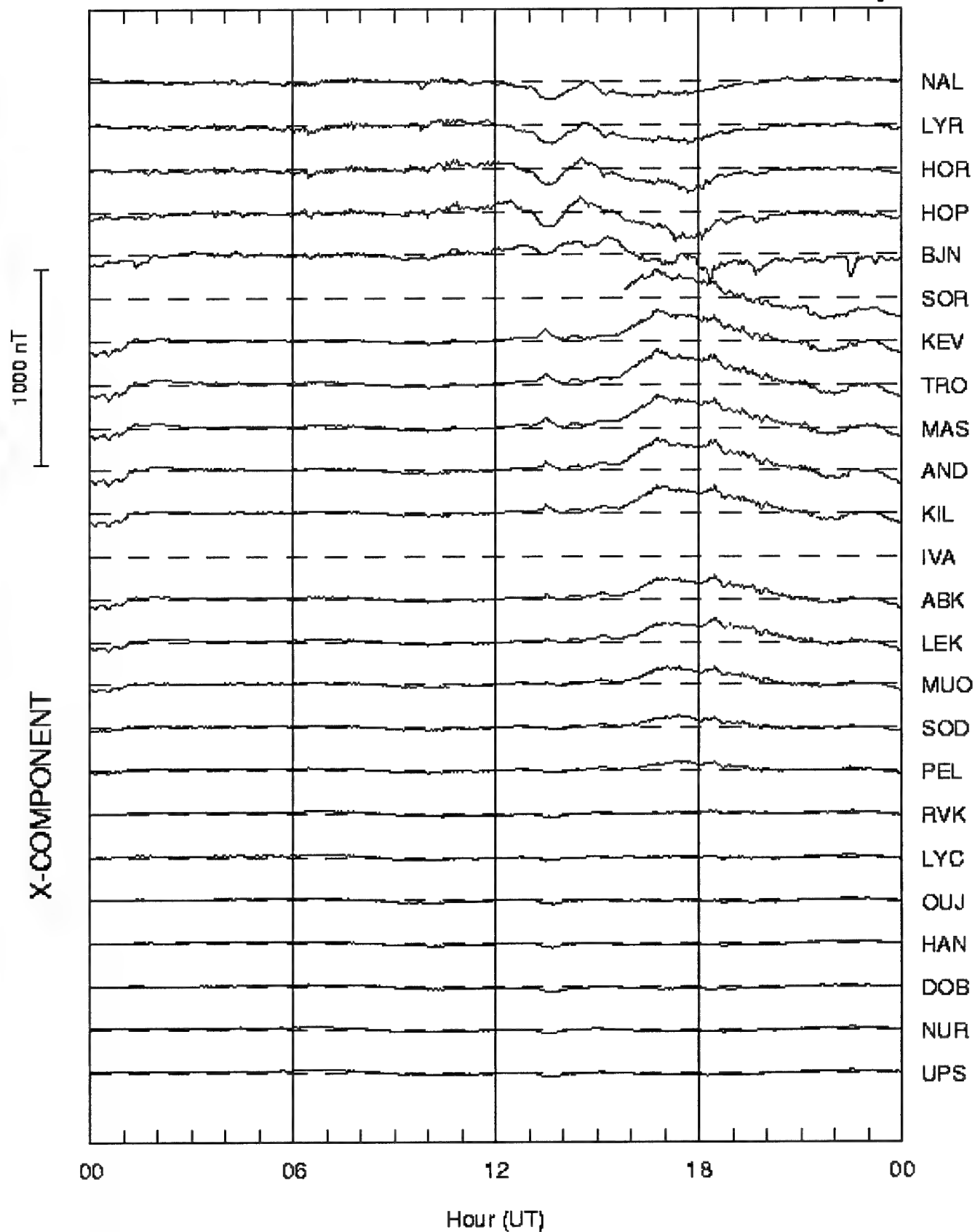


IMAGE magnetometer network 2001-01-16

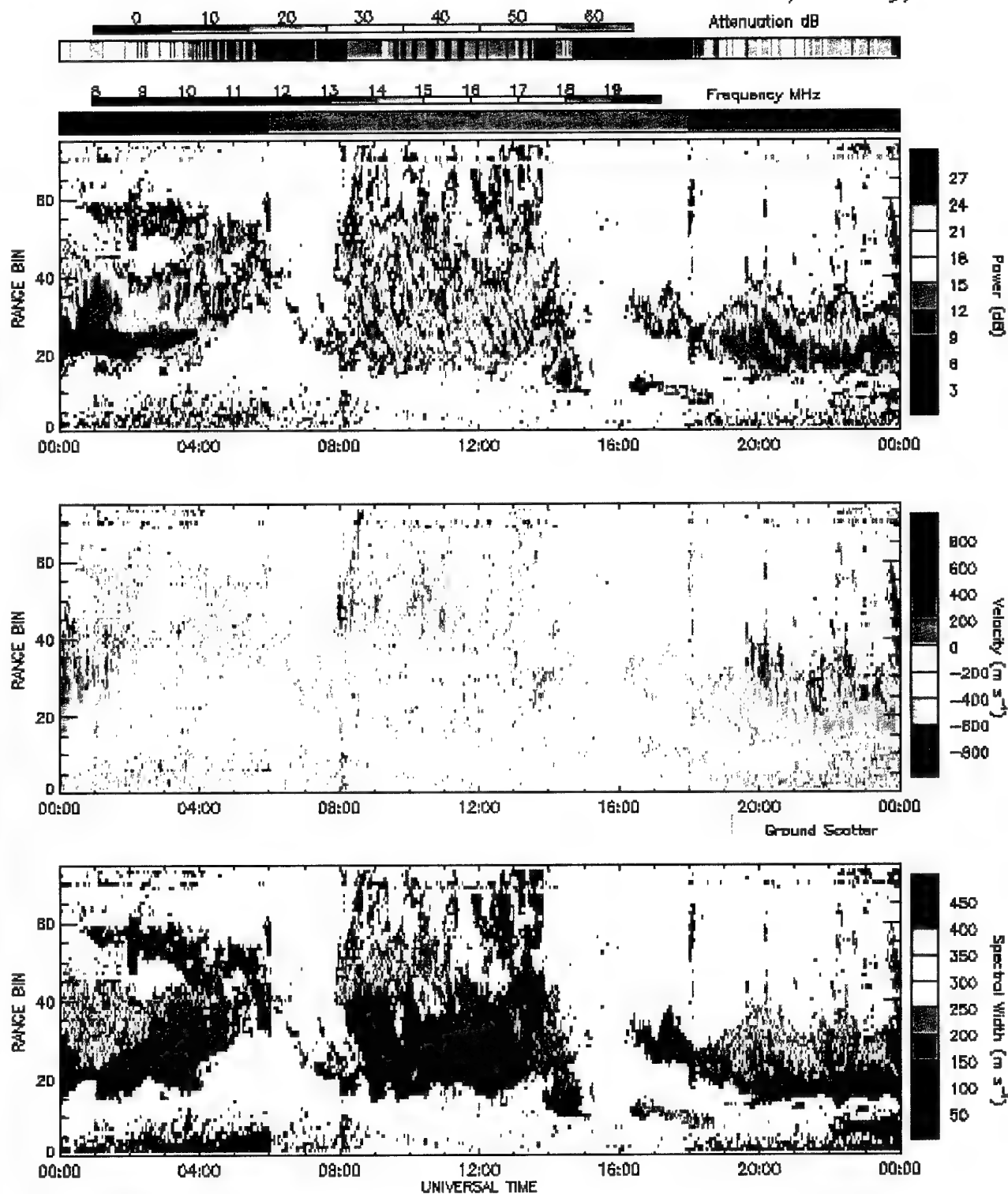
2 minute averages



CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 16/January/2001



Contents, January 17, 2000 :

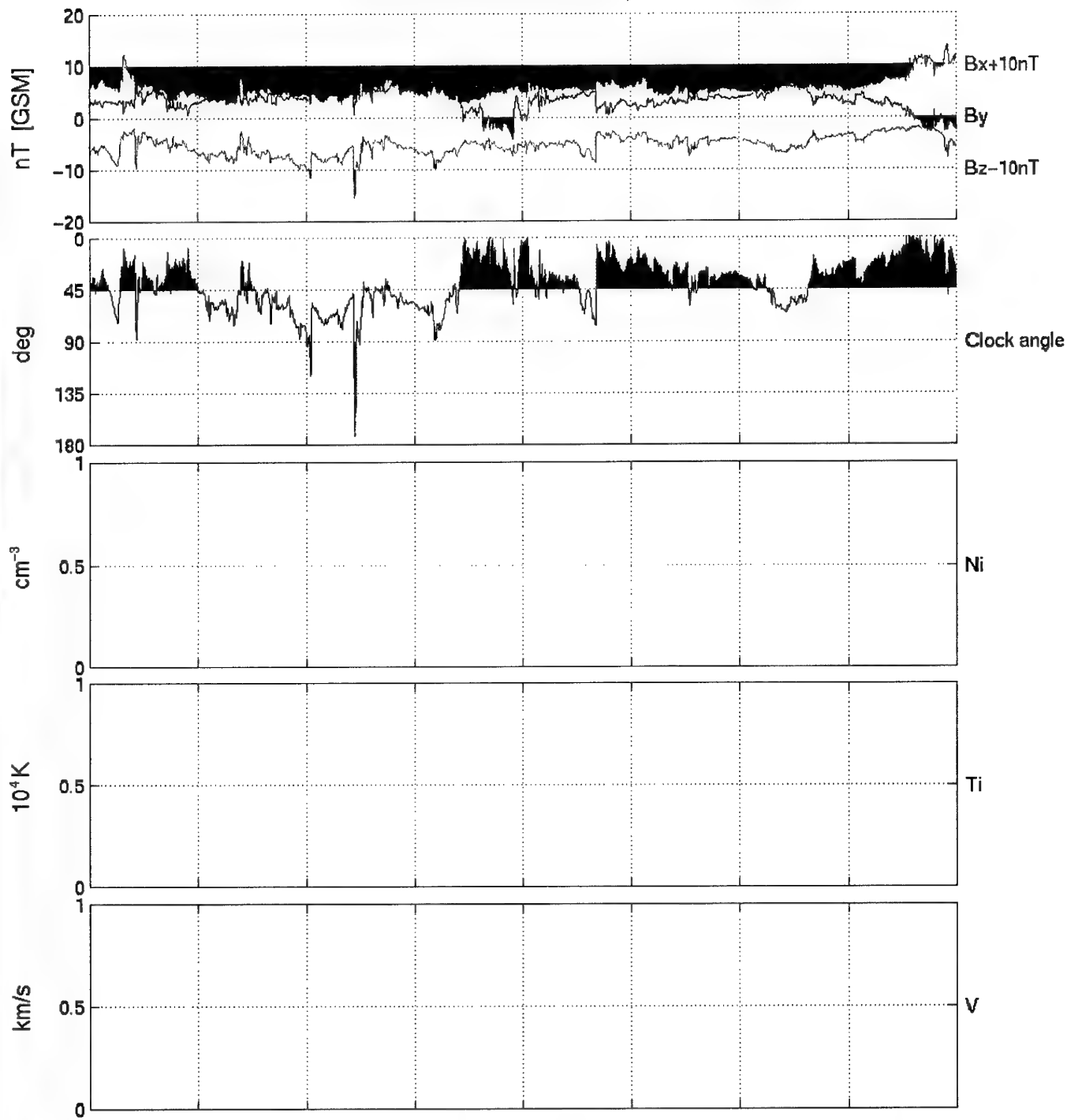
-IMF-ACE plot

-EISCAT Svalbard summary plots(64 sec. resolution)

-IMAGE magnetometer data

-CUTLASS Finland, Range-Time-Parameter plot

ACE: Solar Wind Parameters, Jan 17 2001

[illegible]



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EISCAT SVALBARD RADAR

PCBDYN, 32m, tau0, January 17, 2001

Produced at EISCAT Longyearbyen, 21-Jan-2001

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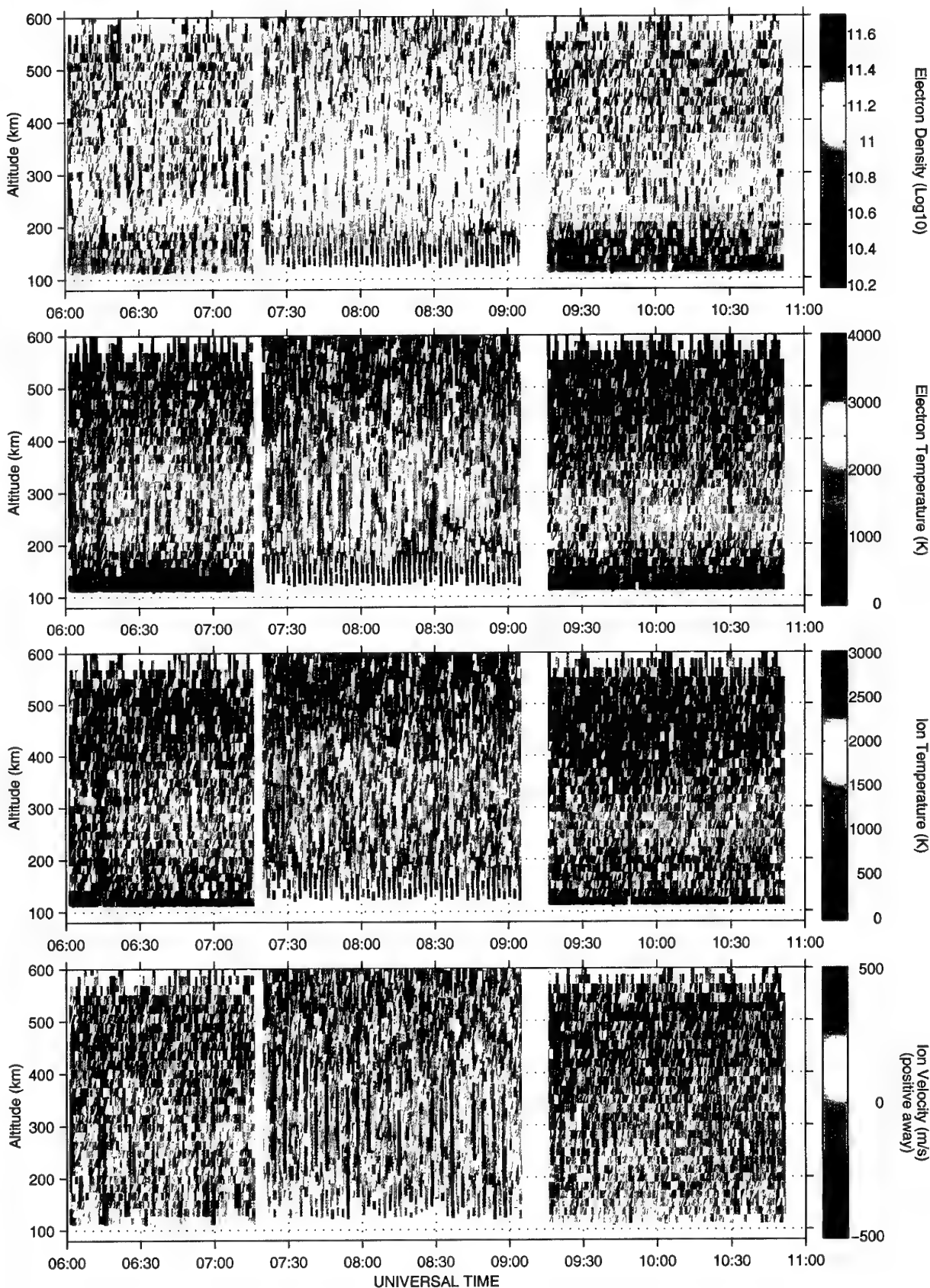
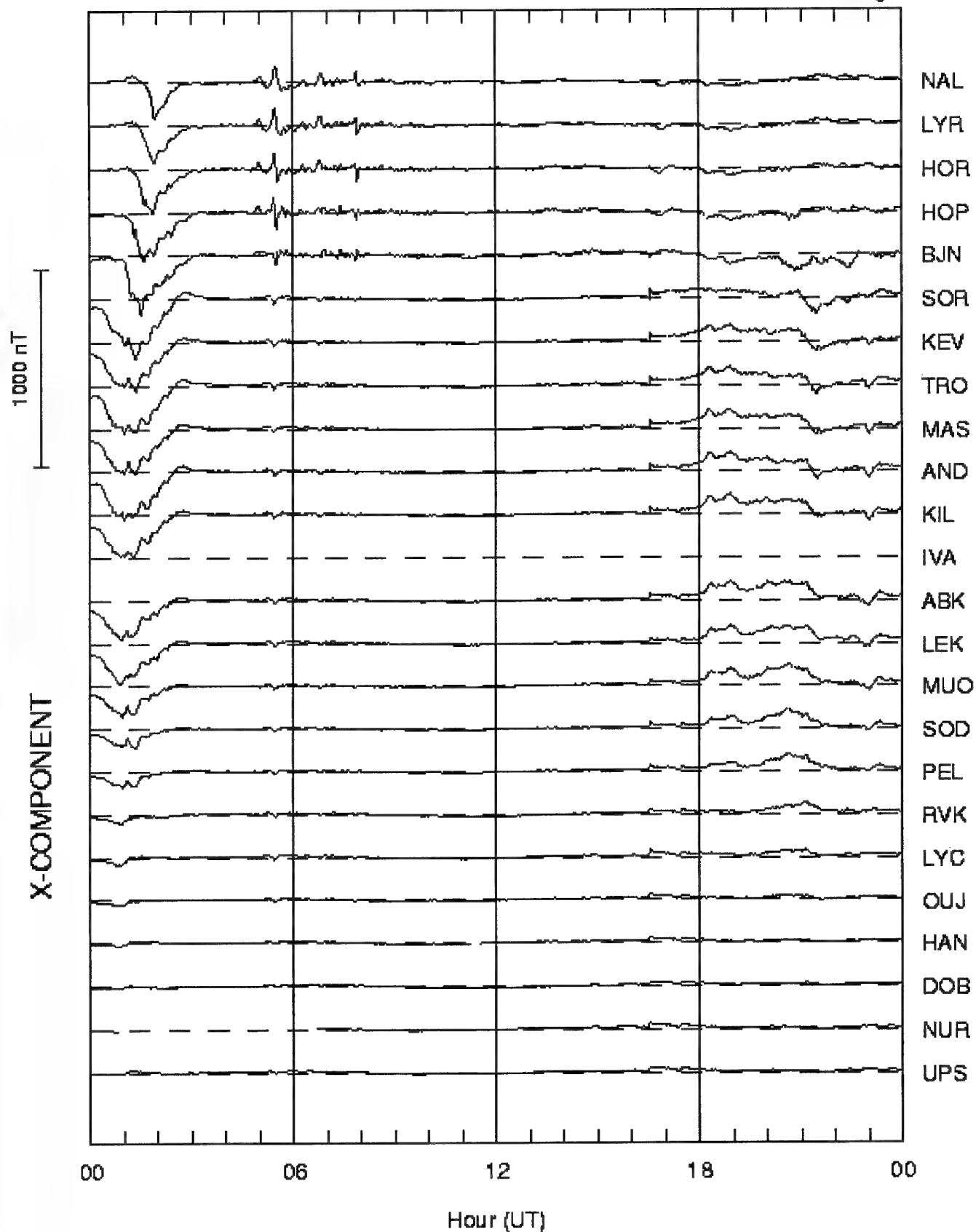


IMAGE magnetometer network 2001-01-17

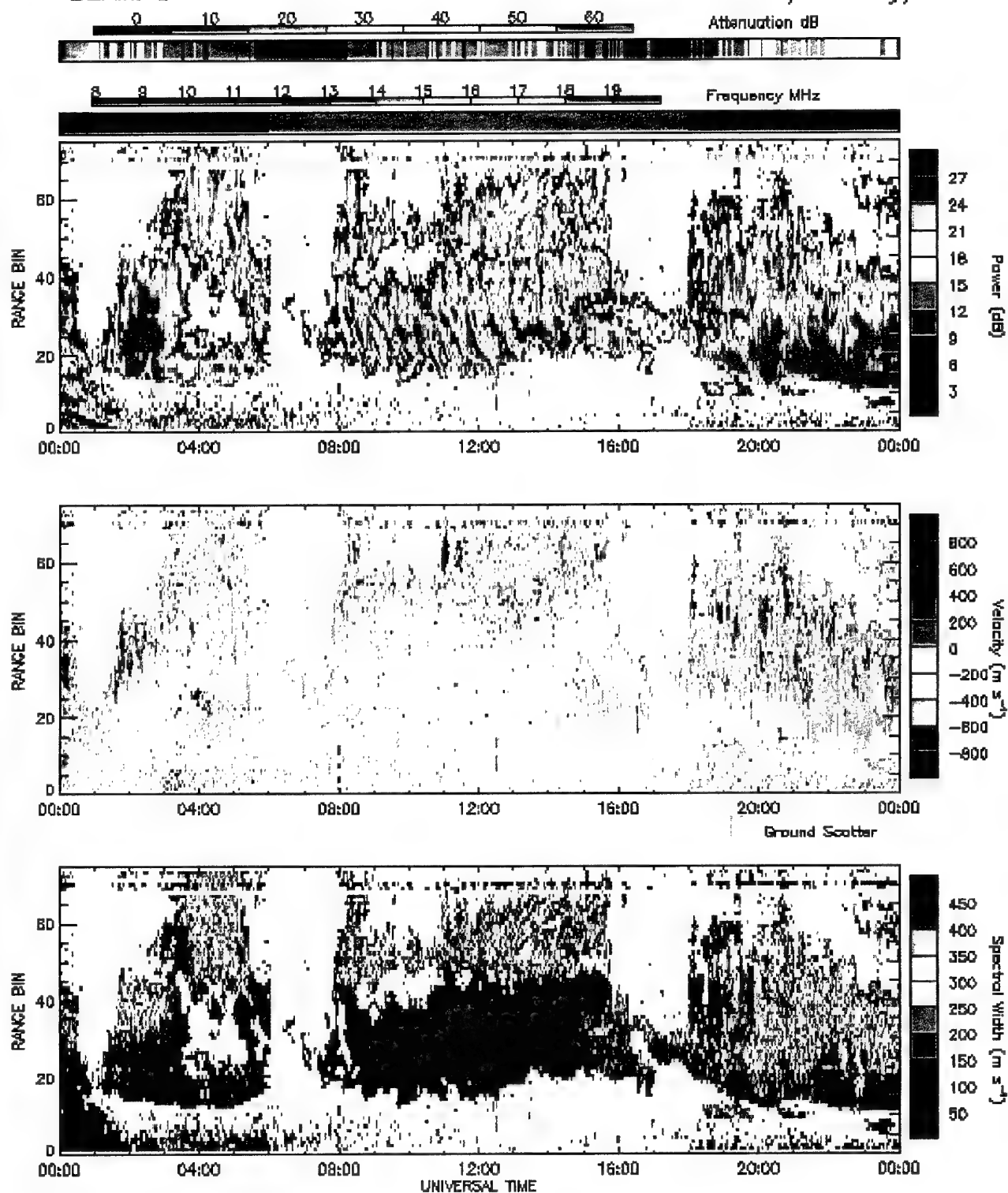
2 minute averages



CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 17/January/2001



Contents, January 18, 2000 :

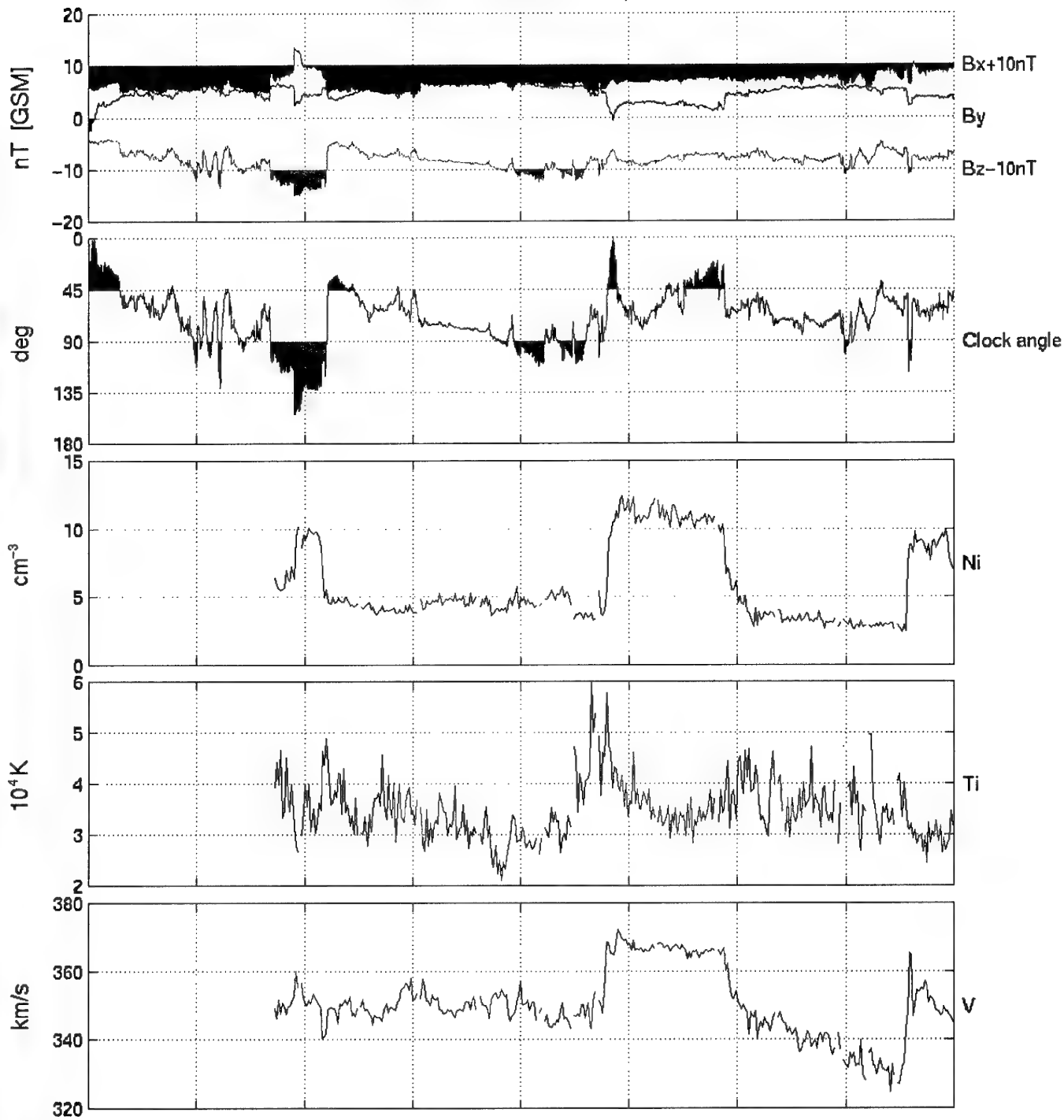
-IMF-ACE plot

-EISCAT Svalbard summary plots(64 sec. resolution)

-IMAGE magnetometer data

-CUTLASS Finland, Range-Time-Parameter plot

ACE: Solar Wind Parameters, Jan 18 2001

[illegible]



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PCBDYN, 32m, tau0, January 18, 2001

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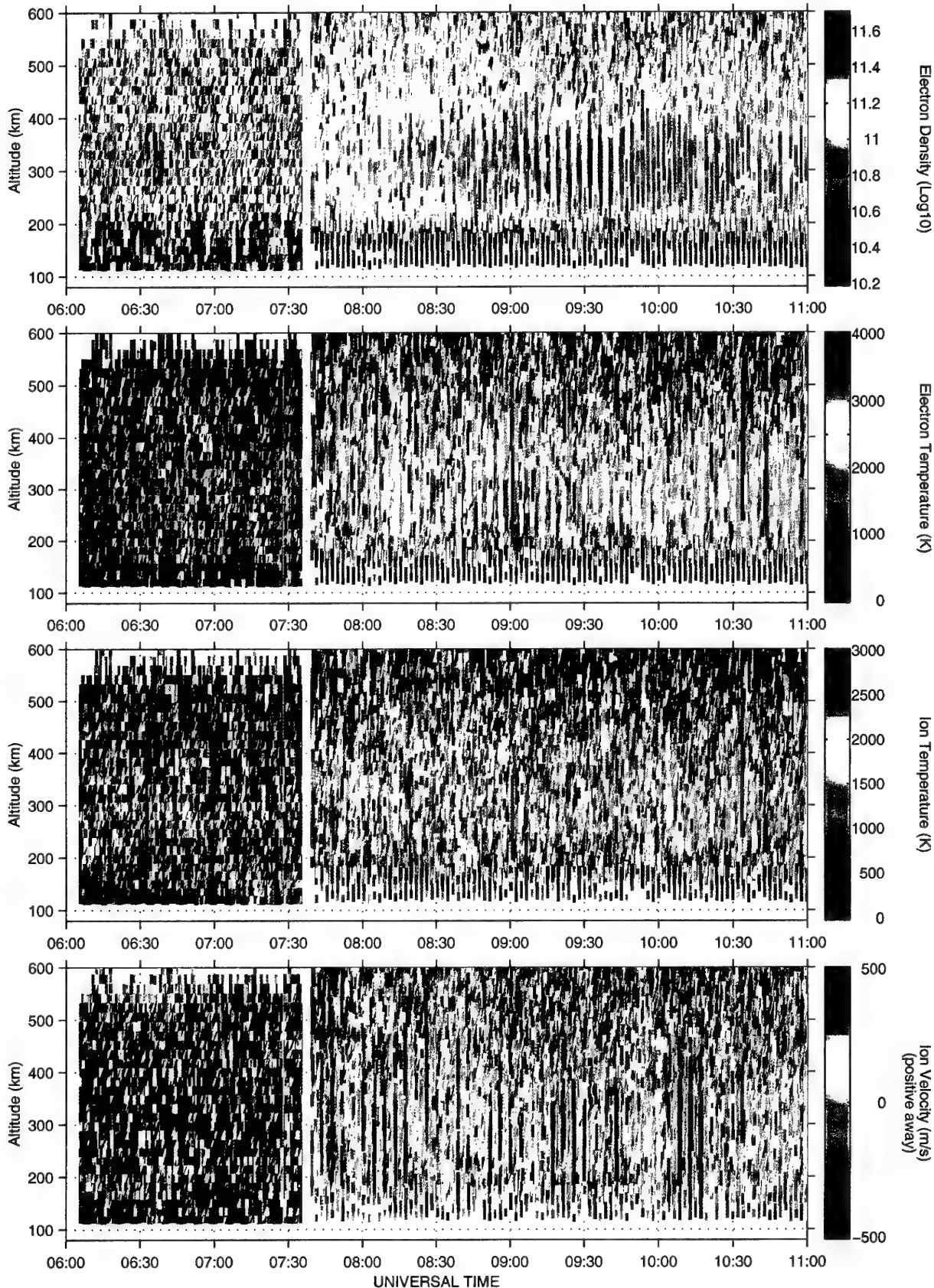
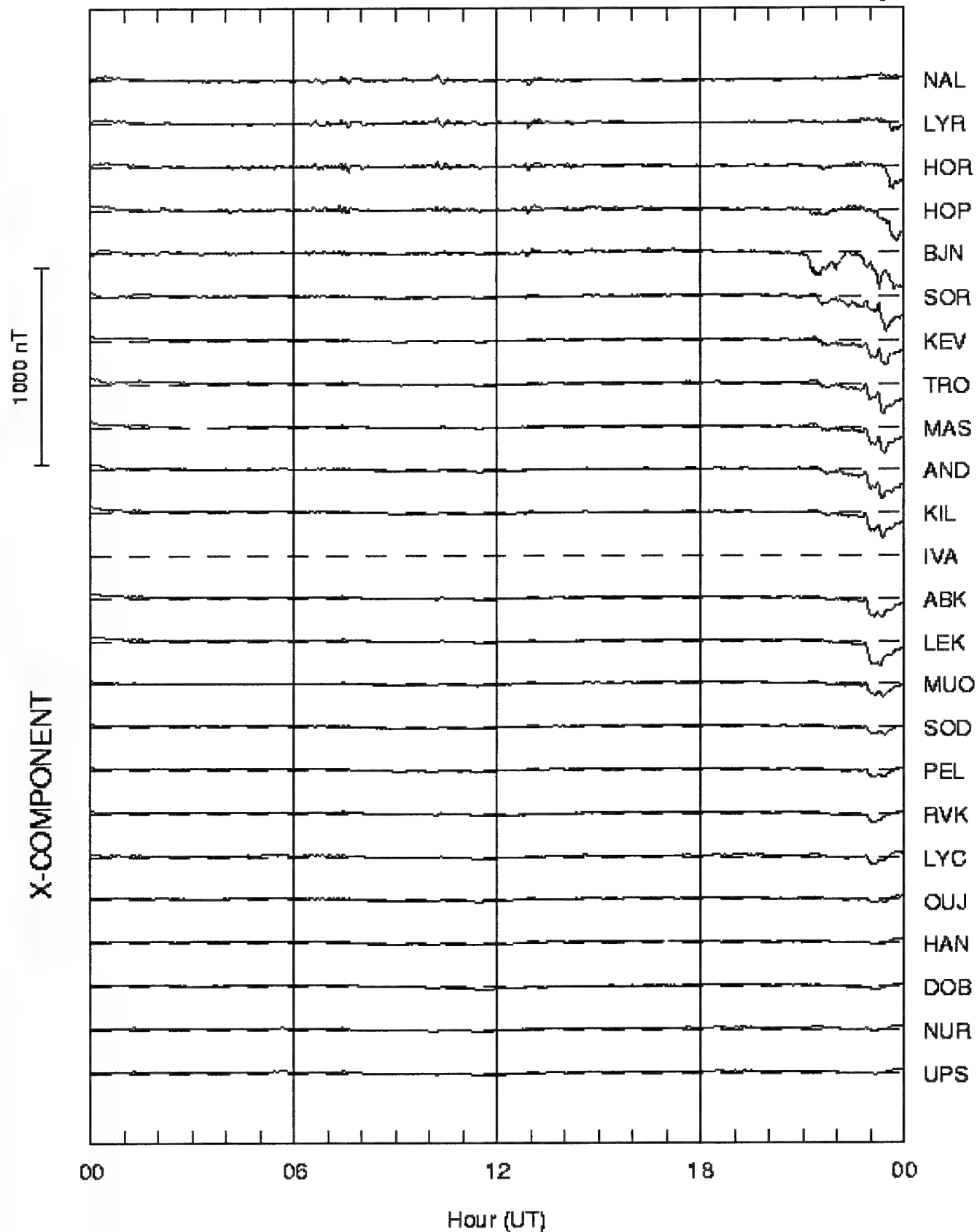


IMAGE magnetometer network 2001-01-18

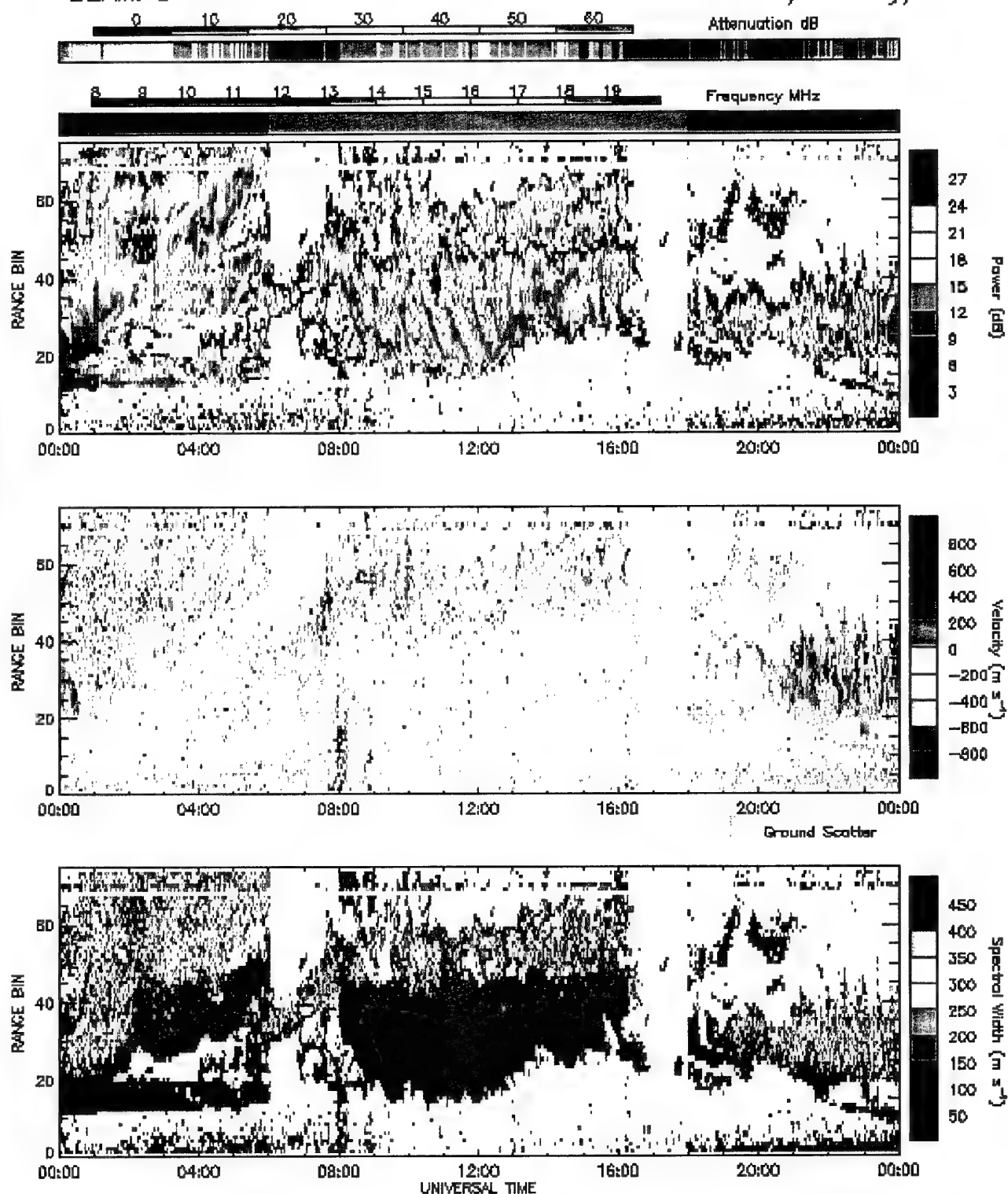
2 minute averages



CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 18/January/2001



Contents, January 19, 2000 :

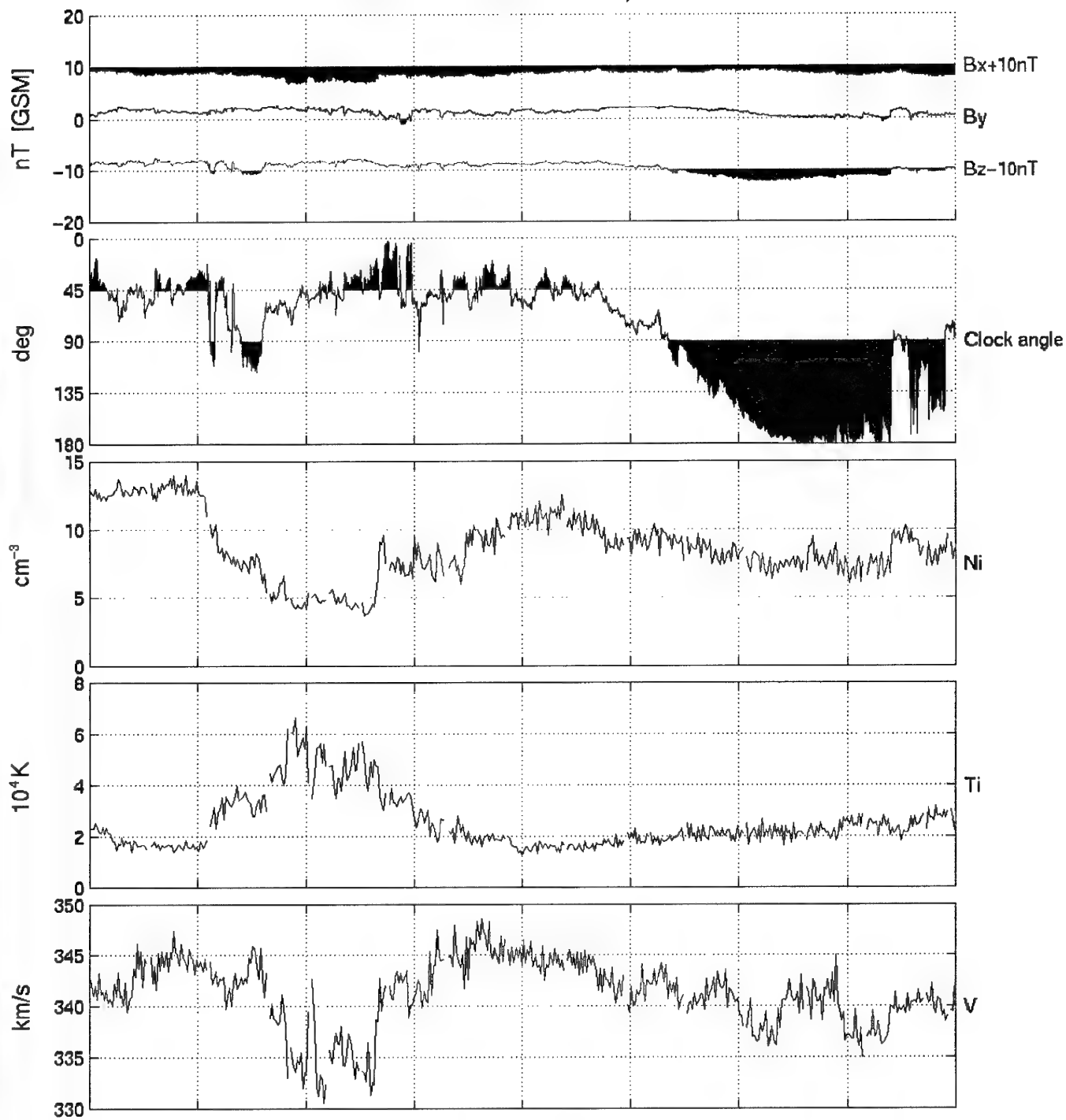
-IMF-ACE plot

-EISCAT Svalbard summary plots(64 sec. resolution)

-IMAGE magnetometer data

-CUTLASS Finland, Range-Time-Parameter plot

ACE: Solar Wind Parameters, Jan 19 2001



UT	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00
X [GSM]	242.5	242.5	242.5	242.5	242.5	242.5	242.5	242.5	242.5
Y [GSM]	-1.5	-1.3	-1.2	-1.1	-1.0	-0.9	-0.7	-0.6	-0.5
Z [GSM]	21.5	21.5	21.5	21.5	21.5	21.6	21.6	21.6	21.6



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PCBDYN, 32m, tau0, January 19, 2001

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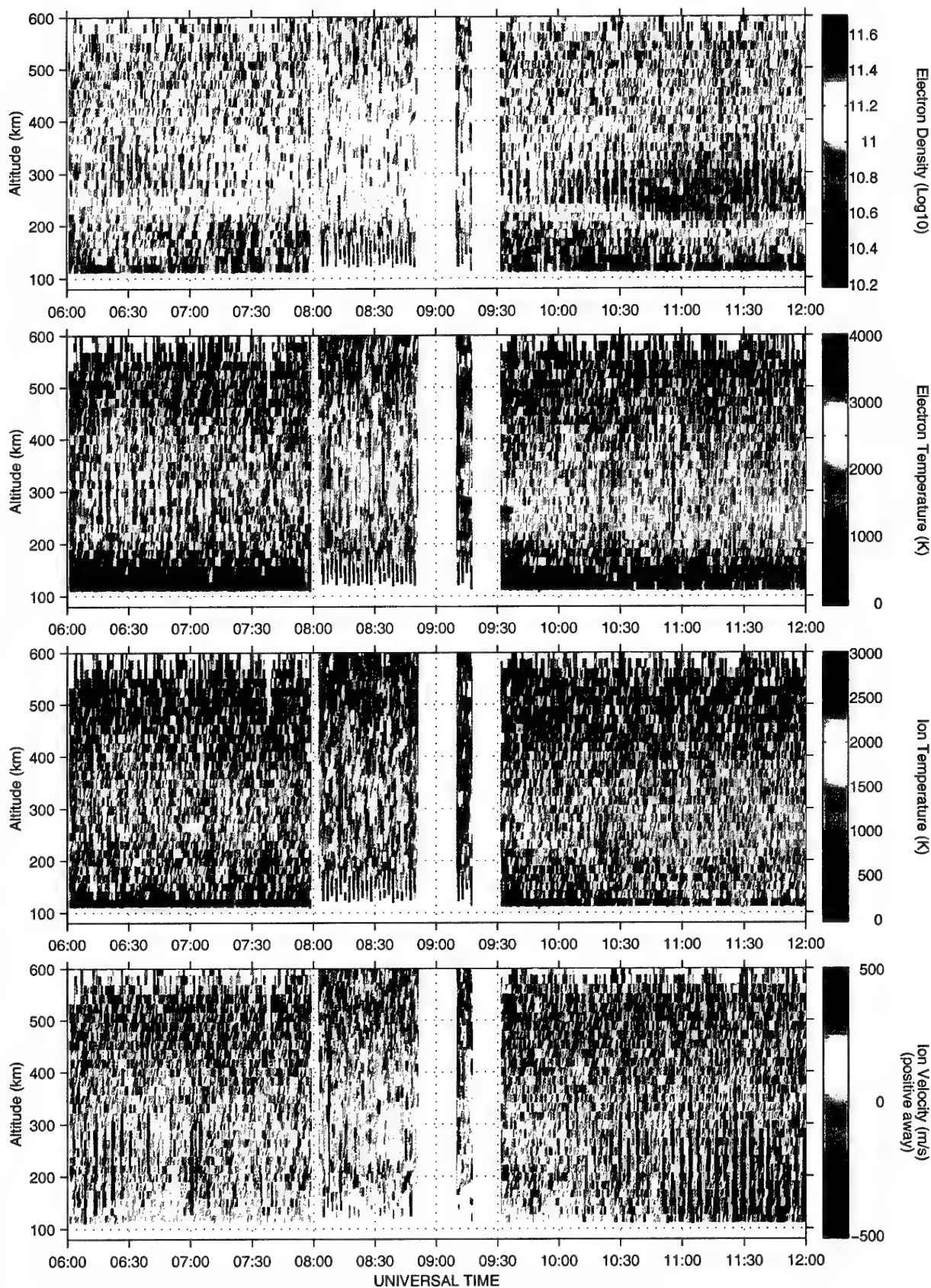
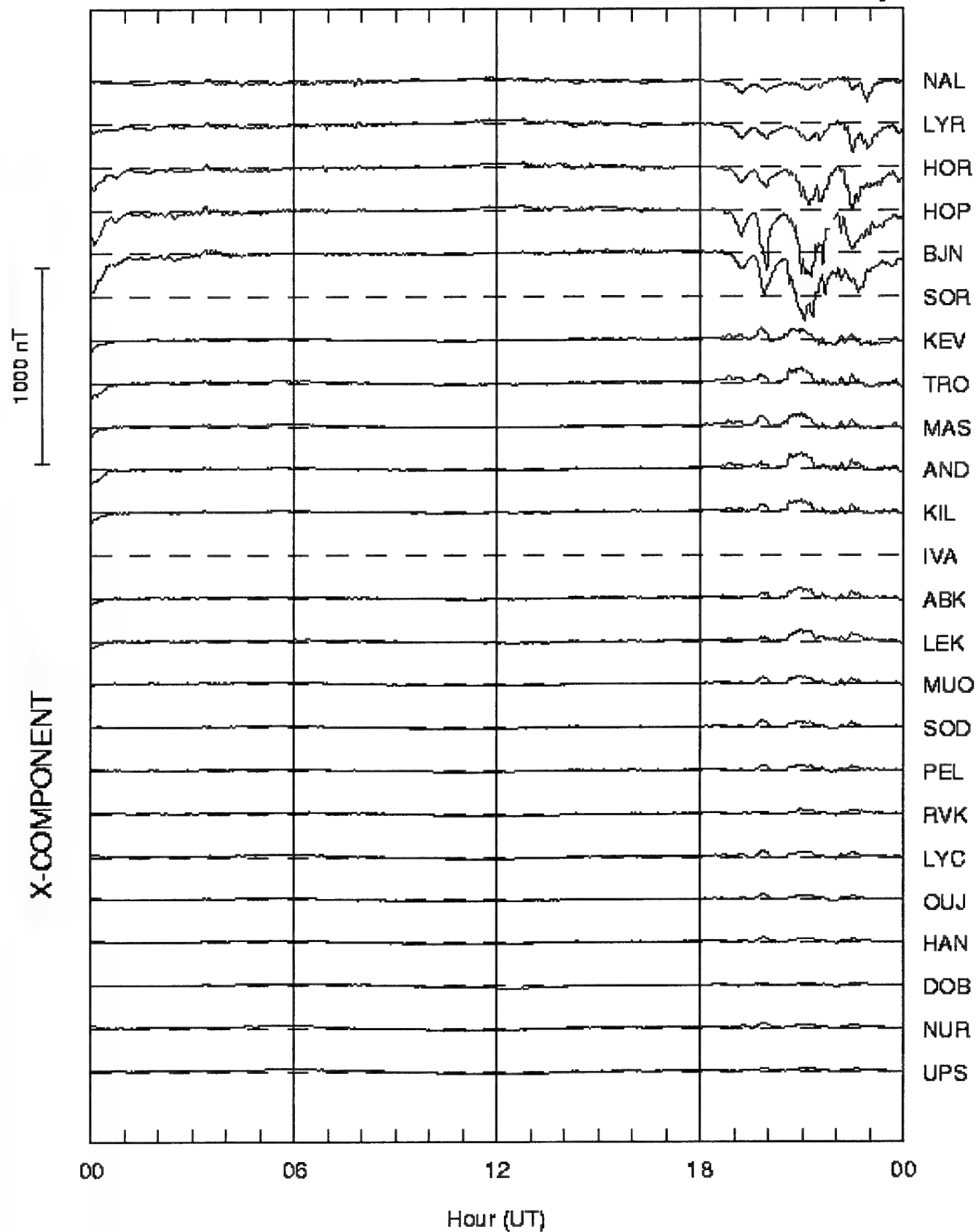


IMAGE magnetometer network 2001-01-19

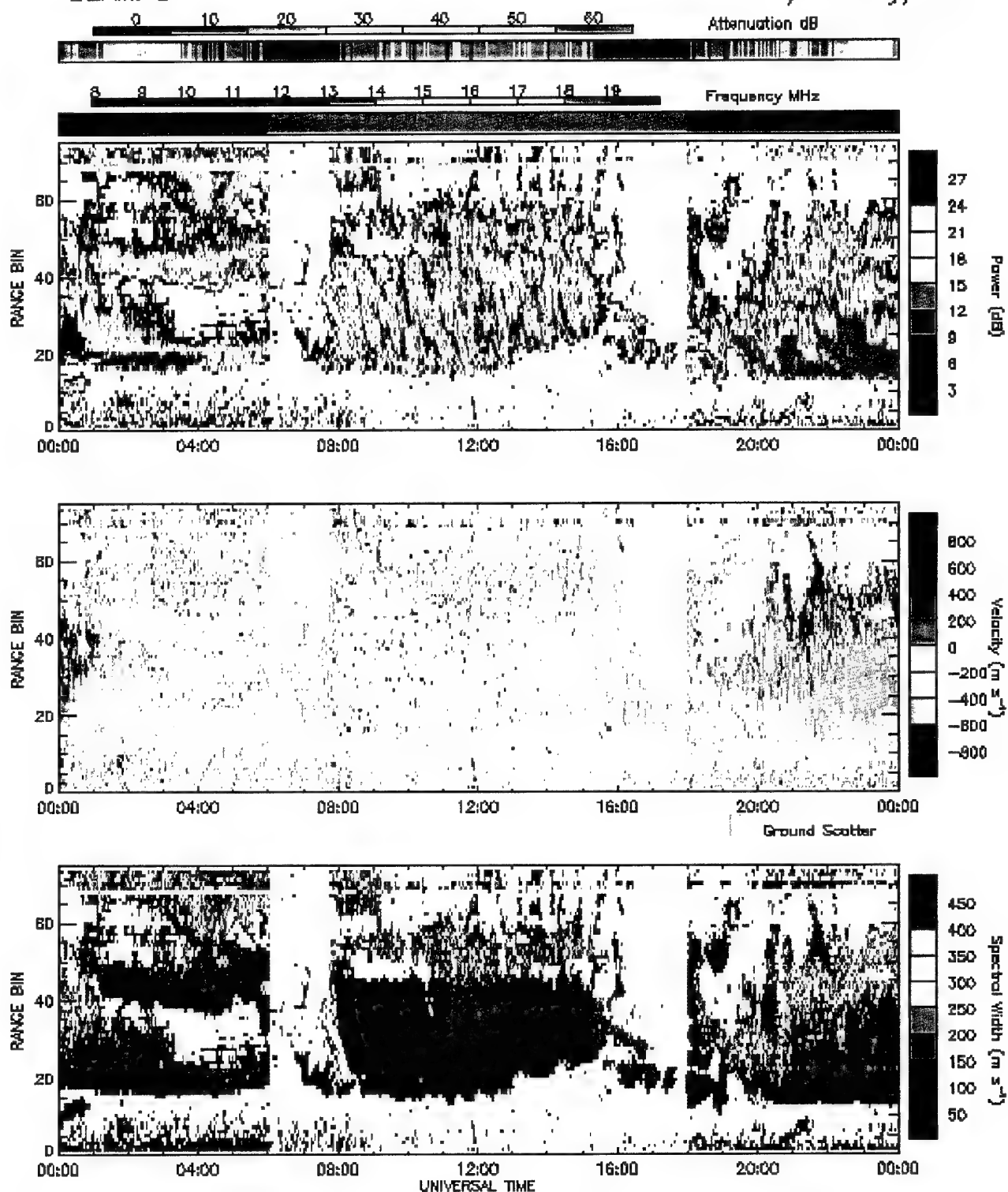
2 minute averages



CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 19/January/2001



Contents, January 20, 2000 :

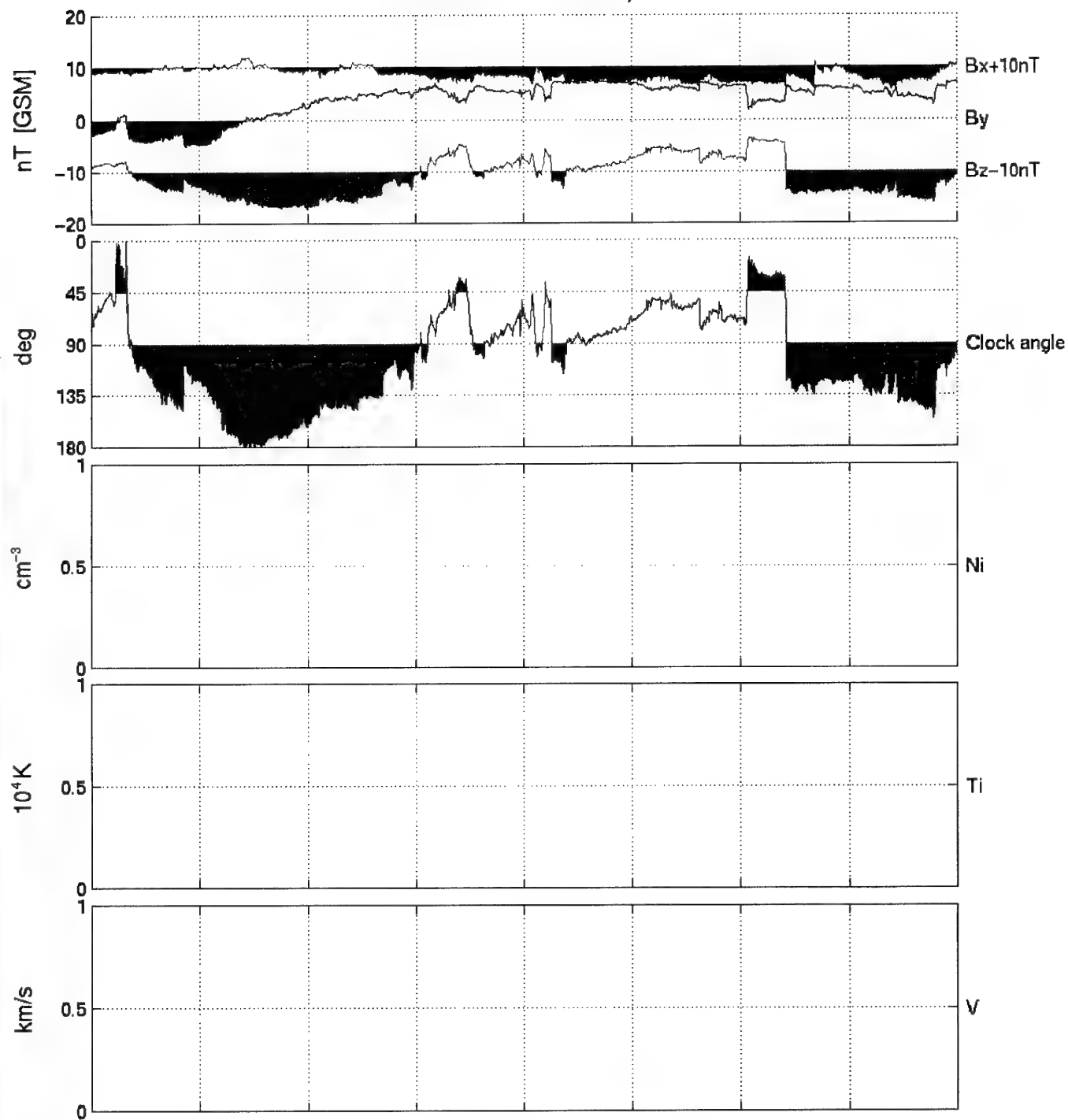
-IMF-ACE plot

-EISCAT Svalbard summary plots(64 sec. resolution)

-IMAGE magnetometer data

-CUTLASS Finland, Range-Time-Parameter plot

ACE: Solar Wind Parameters, Jan 20 2001

[illegible]



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EISCAT SVALBARD RADAR

PCBDYN, 32m, tau0, January 20, 2001

Produced at EISCAT Longyearbyen, 21-Jan-2001

Not for publication - see Rules-of-the-road

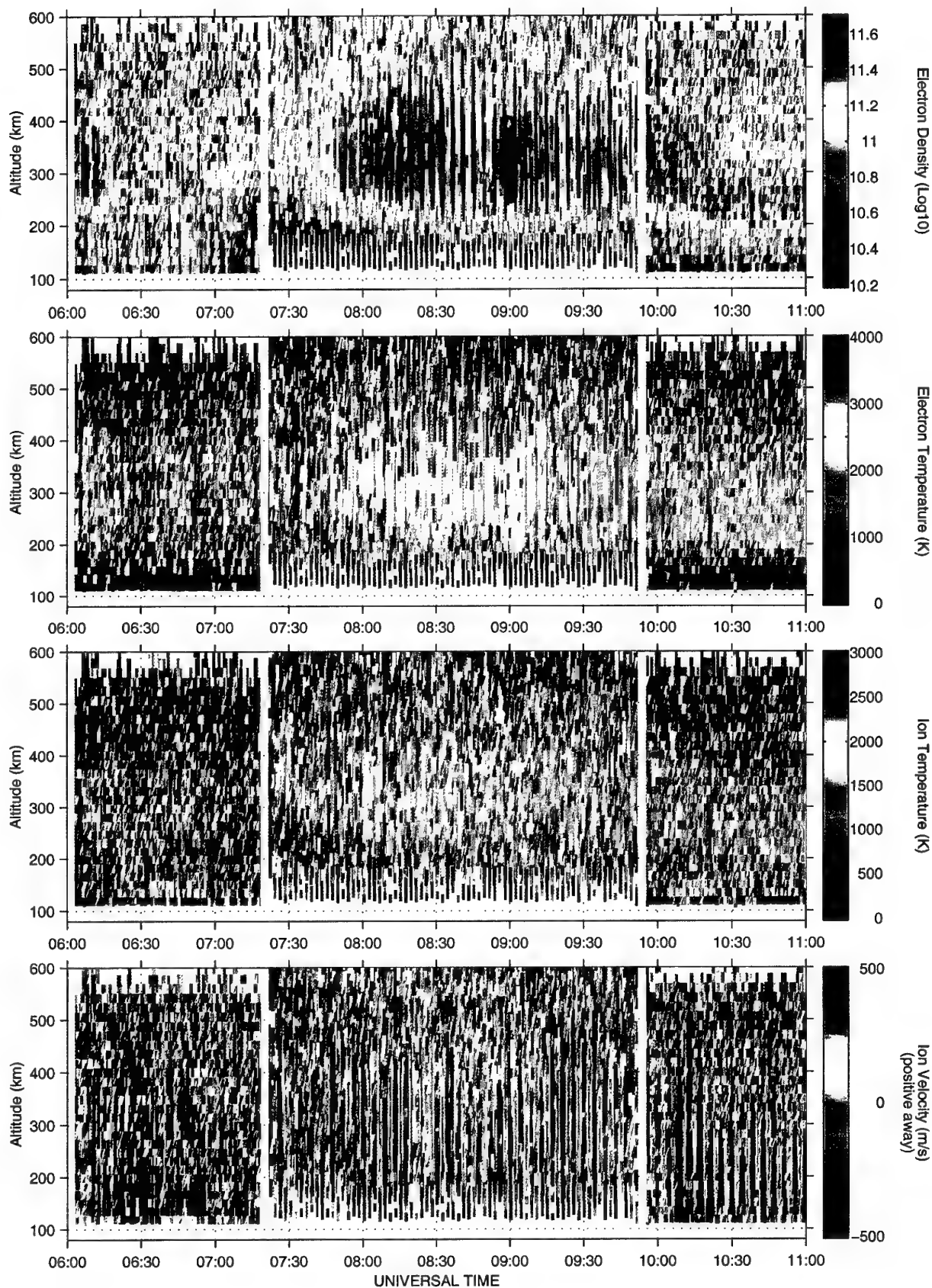
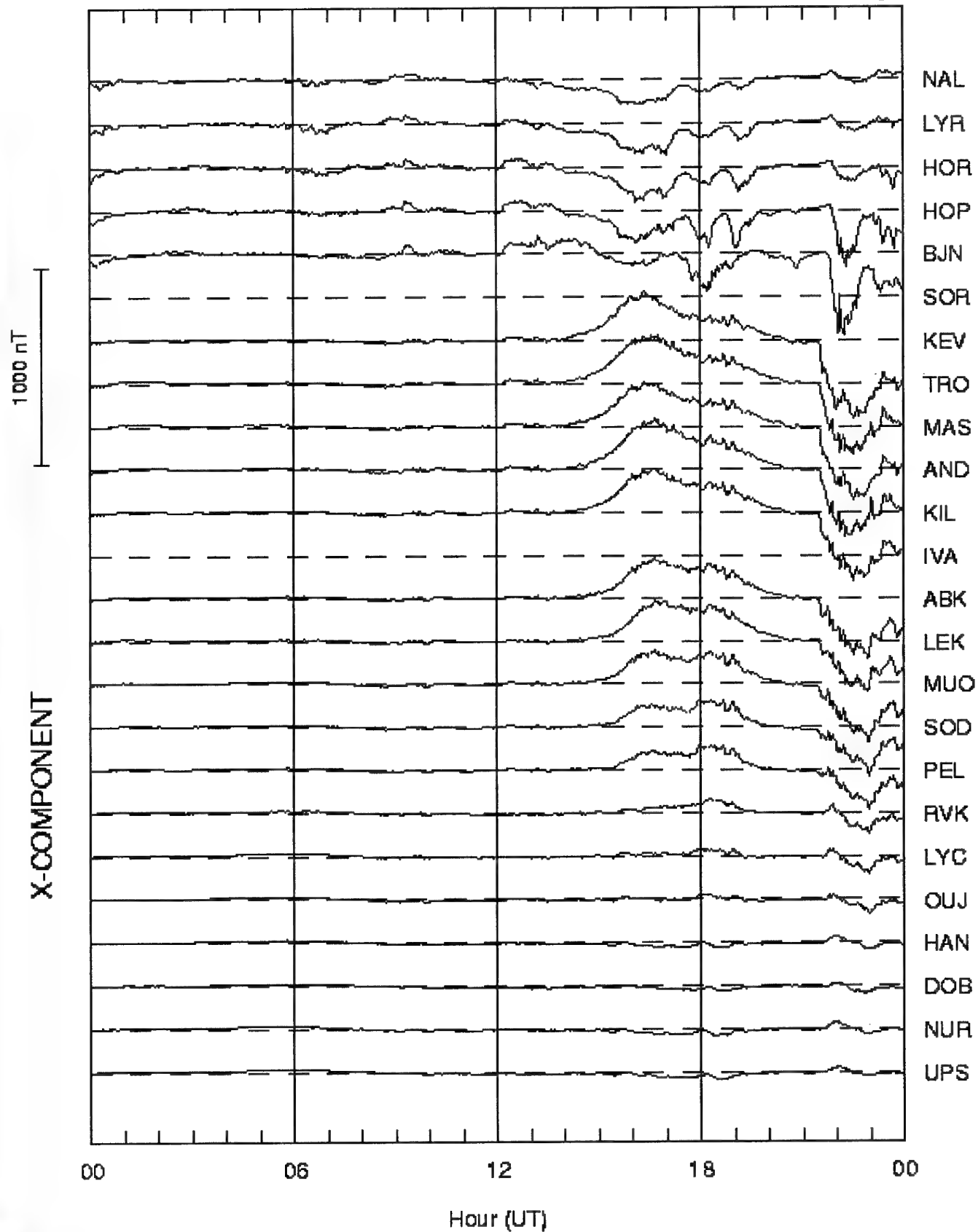


IMAGE magnetometer network 2001-01-20

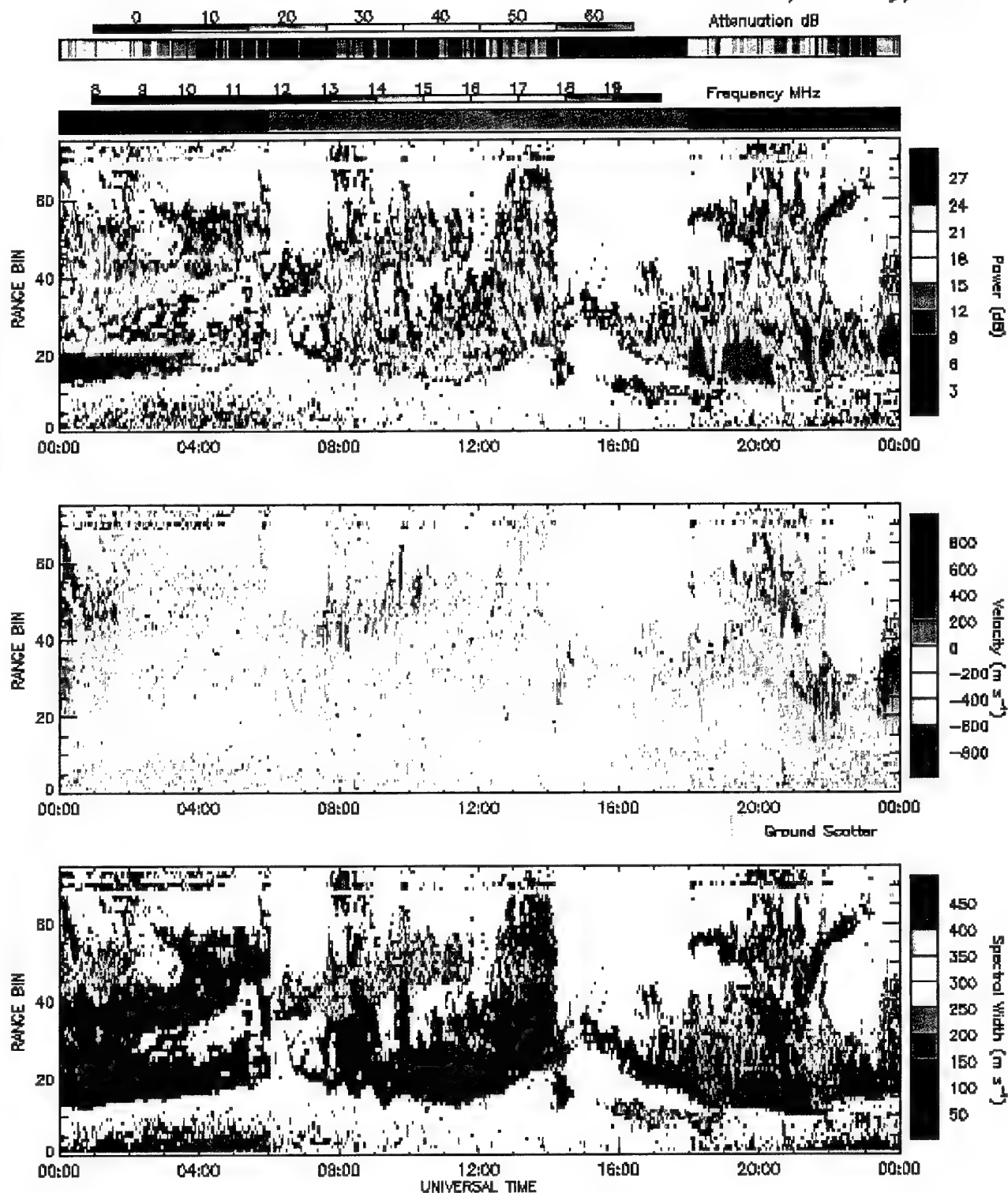
2 minute averages



CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 20/January/2001



Contents, January 25, 2000 :

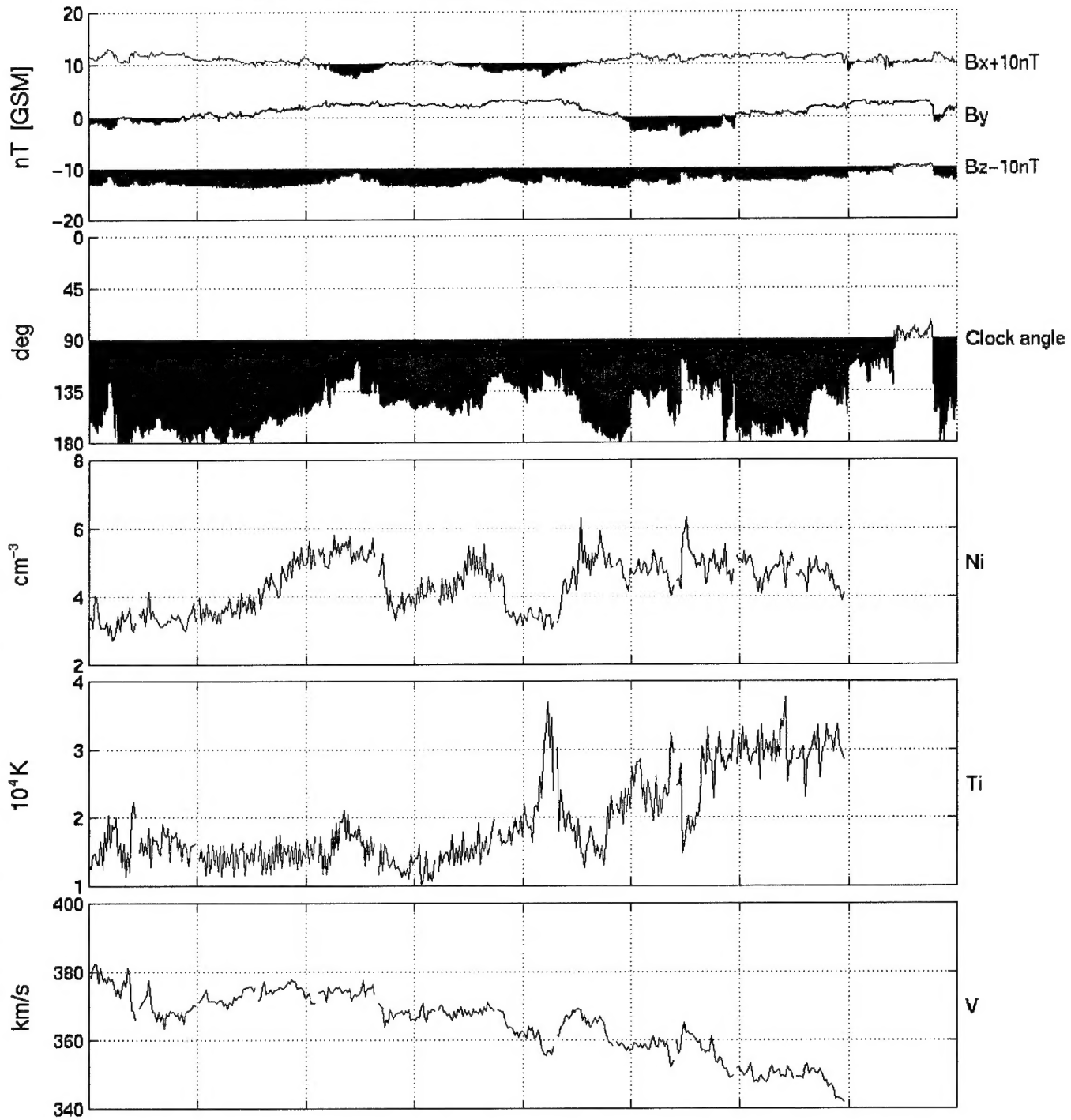
-IMF-ACE plot

-EISCAT Svalbard summary plots(64 sec. resolution)

-IMAGE magnetometer data

-CUTLASS Finland, Range-Time-Parameter plot

ACE: Solar Wind Parameters, Jan 25 2001



UT	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
X [GSM]	242.7	242.7	242.7	242.7	242.7	242.7	242.7	242.7	242.7
Y [GSM]	-10.9	-11.0	-11.1	-11.2	-11.3	-11.5	-11.6	-11.7	-11.8
Z [GSM]	21.9	21.9	21.8	21.8	21.7	21.7	21.6	21.6	21.5



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EISCAT SVALBARD RADAR

PCBDYN-NO, 32m, tau0, January 25, 2001

Produced at EISCAT Longyearbyen, 25-Jan-2001

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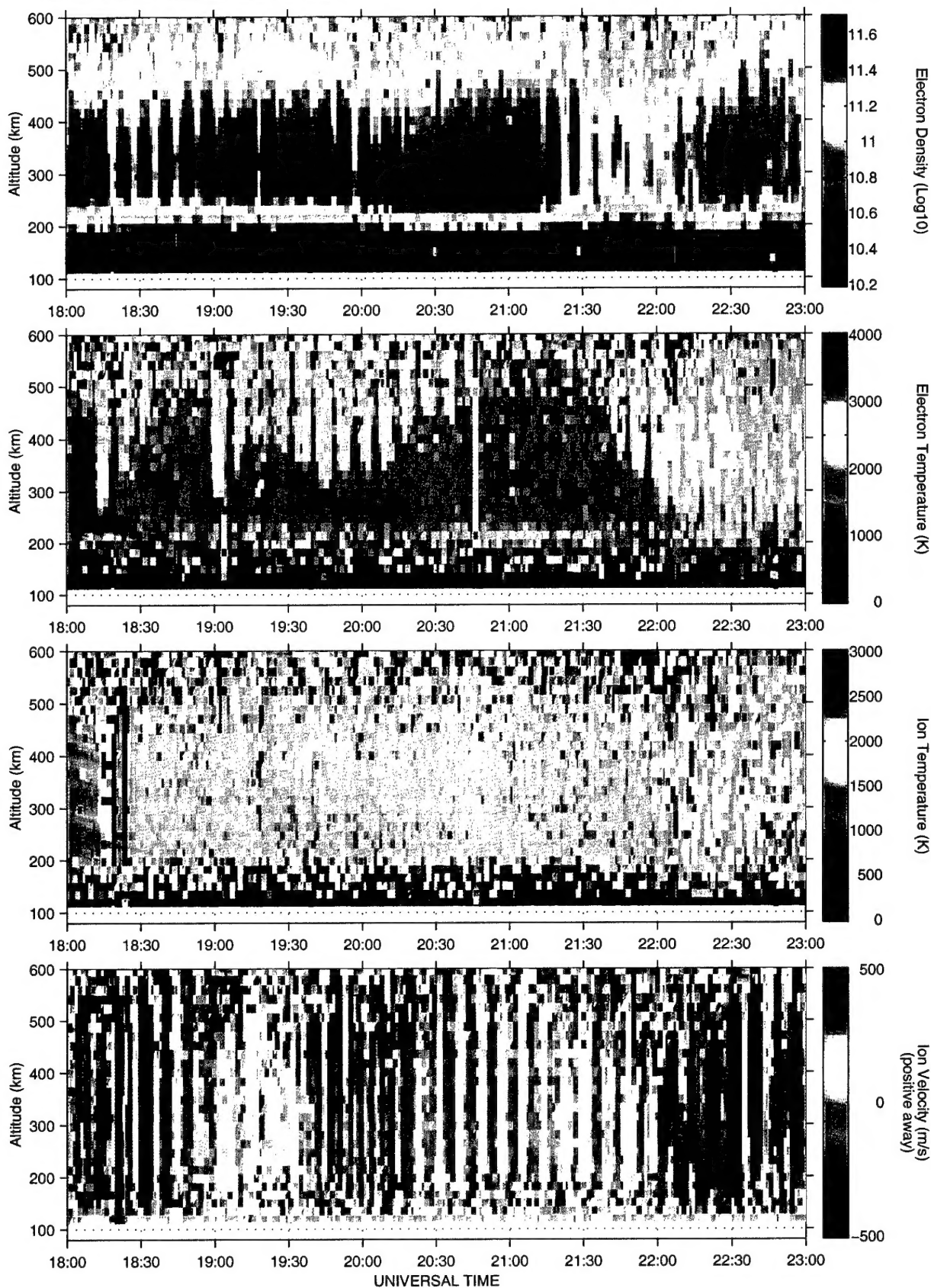
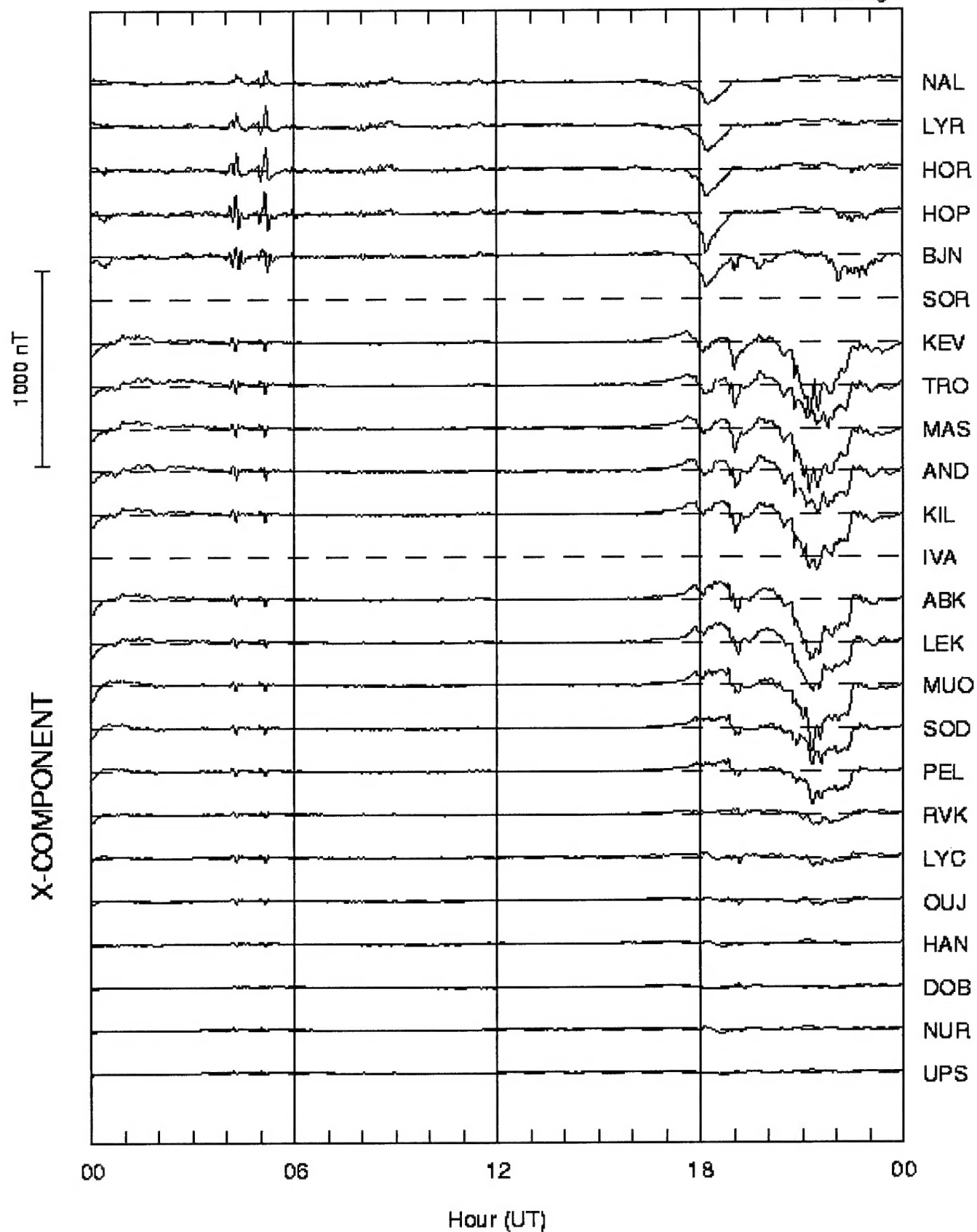


IMAGE magnetometer network 2001-01-25

2 minute averages



CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 25/January/2001

